FELLOWS
OF THE
INDIAN NATIONAL SCIENCE ACADEMY
1935-1993

biographical notes

DIAMOND JUBILEE COMPENDIUM

INDIAN NATIONAL SCIENCE ACADEMY

FELLOWS
OF THE
INDIAN NATIONAL
SCIENCE ACADEMY

Vol. 2

(N - Z)

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INDIAN NATIONAL SCIENCE ACADEMY
Bahadur Shah Zafar Marg, New Delhi-110002

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FOREWORD

At the Indian Science Congress Association meeting held in Bombay in January 1934, the then President of the Science Congress proposed that a Science Academy be formed in order to undertake in India the same role as other premier scientific societies like the Royal Society of London, The Academy of Science of France, and The National Academy of Sciences, USA. Accordingly, the foundation of National Institute of Sciences of India as an All-India body of sciences was laid. In October 1954, the National Institute of Sciences of India was recognized by the Government of India as a premier scientific society representing all branches of science in the country and designated it as the adhering organization in India to the International Council of Scientific Unions (ICSU). The name of the National Institute of Sciences of India was changed to "Indian National Science Academy" in February 1970.

On the occasion of its Diamond Jubilee the Academy is proud to present the Second Compendium of Fellows elected to the Academy since its inception in 1935. Brief sketches of all the 1137 Fellows, including those who are deceased are included in the Compendium in alphabetical order. The Compendium is presented in 2 volumes, the first one covers names starting from A to M and the second volume Fellows beginning with N to Z. Chronological and subject-wise list of Fellows is appended at the end of second volume.

The INSA fellowship has in its fold the distinguished men of science and other luminaries, who have rendered conspicuous service towards the advancement of science and technology. Election to the Fellowship of the Academy has thus come to signify a unique honour and recognition, which is greatly coveted by scientists in India. To that extent, this Compendium may be regarded as an authentic reference guide on India's distinguished Men of Science. The first Compendium of Fellows was brought out on the occasion of its Golden Jubilee. During the last few years the activities of the Academy have vastly expanded; and as many as 235 new Fellows have been elected to the Academy since the publication of the first Compendium in 1984. Therefore, the Academy decided to bring out the second Compendium of the Fellows.

I wish to place on record my thanks to Professor T. J. Pandian, Shri P. S. Shankar, and staff of the Academy for their painstaking, dedicated efforts to put together this Compendium within a short time. The Editor and his team of officers have made every effort to collect adequate information about all the elected Fellows.

I have great pleasure to present this Second Compendium of the Fellows of our Academy.

S. K. JOSHI
President
Indian National Science Academy

New Delhi
January 1994

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NADKARNI, Mahendra Ganpatrao

Elected 1991

Born 17 January 1939; Indore, Madhya Pradesh
Ph.D. (1965), Brown University, USA

Specialization: Statistics: Commutative Harmonic Analysis and Ergodic Theory

Research Achievements: Nadkarni's research relates to (i) systematic use of systems of imprimitivity to spectral questions in ergodic theory, (ii) descriptive set theoretic aspects of ergodic theory, and (iii) non-singular dynamics, in which he has made significant contributions.

Positions: Bal Gangadhar Jambhekar Professor of Mathematics, University of Bombay (1980-); Professor, Indian Statistical Institute, Calcutta (1972-80).

Learned and Professional Societies: Fellow, Maharashtra Academy of Sciences and Indian Academy of Sciences.

Lectureships: Cullis Memorial Lecture (Calcutta Mathematical Society); Gujarat Science Association Plenary Lecture.

Policy-making Bodies: Member, governing council of Indian Statistical Institute, and National Board of Higher Mathematics.

Address: Department of Mathematics, University of Bombay, Vidya Nagari, Vidya Nagari Marg, Bombay 400 098; Tel: (022) 5113091-95 (Ext 285); Res: Flat 12/B/1 Vidya Nagari, Vidya Nagari Marg, Kalina, Bombay 400 098; Tel: (022) 6147217.

NAG, Biswaranjan

Elected 1978

Born 1 October 1932; Comilla, Bangladesh
D.Sc. (1972), University of Calcutta

Specialization: Semiconductor Physics, Solid State and Microwave Electronics

Research Achievements: Nag has developed microwave methods for characterizing semiconductors; made original contributions to the theory of electron transport in elemental and compound semiconductors under various ambient conditions; and developed the theory of energy band structure and electron scattering in superlattices and quantum wells of nonparabolic semiconductors.

Positions: Sisir Kumar Mitra Professor of Radio Physics and Electronics, University of Calcutta, Calcutta; Commonwealth Visiting Professor, Bangor, N. Wales (1971-72).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Indian National Academy of Engineering.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1975); INSA Prize for Materials Science (1993).

Author/Editor Facet: Authored two books: 'Theory of Electrical Transport in Semiconductors' (Pergamon, 1972) and 'Electron Transport in Compound Semiconductors' (Springer- Verlag, 1980).

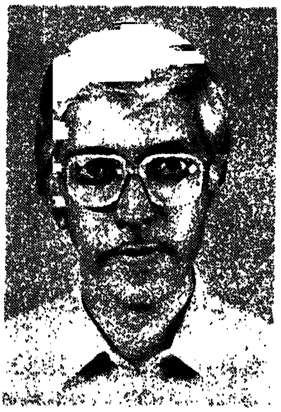
Address: Sisir Mitra Bhavan, 92 APC Road, Calcutta 700 009; Res: EC 203, Salt Lake, Calcutta 700 064; Tel: (033) 372696.

NAG, Kamalaksha

Elected 1990

Born 6 July 1942; Bangladesh
Ph.D. (1968), University of Calcutta

Specialization: Inorganic Chemistry



Research Achievements: Nag's contributions relate to finding out structure-property relations in multinuclear macrocyclic complexes of transition metals involving cooperative interactions between metal centres; activation of molecules by coordination to metal ions; modelling of the active sites of metallobiomolecules; solid electrolytes exhibiting very high conductivity; and rare earth complexes with novel structural features.

Positions: Professor of Chemistry, Department of Inorganic Chemistry, Indian Association for the Cultivation of Science, Calcutta.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Address: Professor, Department of Inorganic Chemistry, Indian Association for the Cultivation of Science, Calcutta 700 032; Tel: (033) 4734971; Fax: 91-33-4732805; E-mail: inorg.iacs.ernet.in; Res: B-26, Jayashri Park, Behala, Calcutta 700 034; Tel: (033) 772575.

NAG CHAUDHURI, Basanti Dulal

Elected 1964

Born 6 September 1917; Calcutta, West Bengal
Ph.D. (1940), University of California, Berkeley, USA; D.Sc. *(h.c.)*, Andhra and Kanpur universities

Specialization: Nuclear Physics

Research Achievements: Nag Chaudhuri has made noteworthy contributions to nuclear isomerism, artificial radioactivity, Cerenkov phenomenon and low-temperature plasma.

Positions: Palit Professor, University of Calcutta; Director, Saha Institute of Nuclear Physics, Calcutta; Vice-Chancellor, Jawaharlal Nehru University, New Delhi; Member, Planning Commission; Scientific Adviser, Ministry of Defence; Chairman, Cabinet Committee on Science and Technology; Visiting Professor, University of Illinois, Urbana (1961-62), University of Science & Technology, Kumasi, Ghana, Andhra and Kanpur Universities (1980-81).

Learned and Professional Societies: Fellow, National Academy of Sciences (India) and Indian Physical Society; Member, American Physical Society; Secretary (1969-70), Vice- President (1971-72), Foreign Secretary (1973-76), INSA.

Awards and Honours: Padma Vibhushan.

Lectureships: Lincoln Lecturer (USA).

Author/Editor Facet: Written many books including (i) 'Technology and Society', (ii) 'Science and Society', and (iii) 'Environmental Management in Developing Countries'; served as editor of *Sci. & Cult.*

Policy-making Bodies: Chairman, Cabinet Committee of Science & Technology, Government of India (1969-72), National Committee on Environmental Planning and Co-ordination, Government of India (1975-77), Research Advisory Council, National Physical Laboratory, Delhi (1980-82), Board of Research in Nuclear Sciences of Department of Atomic Energy (1975-77), Bharat Dynamics Ltd (1974-76); Member and Vice- Chairman, Board of Governors, East West Centre, Honolulu, Hawaii; Member, International Centre for Theoretical Physics, Trieste (1976-84); Trustee, Member and Vice-Chairman, International Foundation for Science, Stockholm (1976-82), Member, Board of Directors, Bharat Electronics Ltd, Bangalore and Hindustan Aeronautics Ltd, Bangalore.

Address: 43A Biren Roy Road (East), Behala, Calcutta 700 008; Tel: (033) 771152.

NAGABUSHANAM, Rachakonda

Elected 1981

Born 1 July 1931; Visakhapatnam, Andhra Pradesh
D.Sc. (1957), Andhra University; Ph.D. (1962), Tulane University, USA

Specialization: Marine Biology, Animal Zoology

Research Achievements: Nagabhushanam has done much work in marine biology and invertebrate endocrinology. He has shown that hormones play an important role in controlling the reproduction in shellfish. He has confirmed that in oysters, clams and prawns, neurosecretory products control reproduction. His findings are of importance to the aquaculture practice of Indian oysters and prawns.

Positions: Professor and Head (1971-), Reader (1964-71), Department of Zoology, Marathwada University, Aurangabad; Reader in Zoology, Andhra University, Waltair (1962-64).

Learned and Professional Societies: Fellow, National Academy of Sciences (India) and Zoological Society of India; Member, Marine Biological Association (UK) and American Society of Zoology; (sometime President), Indian Society of Comparative Endocrinology, Indian Society of Comparative Physiology and Indian Society of Invertebrate Reproduction.

Awards and Honours: Best Teacher Award (Government of Maharashtra) (1983); UGC National Lecturer.

Author/Editor Facet: Served on the editorial board of *Indian J. Exp. Biol.*

Policy-making Bodies: Served on various boards/committees of CSIR, ICAR, UGC, DST, DOD and DOE.

Address: Professor & Head, Department of Zoology, Marathwada University, Aurangabad 431 003; Tel: (02432) 4431/36; Res: 103, Shreyanagar, Aurangabad 431 005; Tel: (02432) 27401.

NAGAPPA, Yedatore *Elected 1955*

Born 2 October 1907
M.Sc. (1933), University of Mysore

Specialization: Geology

Research Achievements: Nagappa specialized in Tertiary palaeontology, particularly in Foraminifera and Ostracoda. He carried out field investigations for four seasons in parts of Sind, Baluchistan, Punjab and North West Frontier Province, and the Tertiary successions in parts of Assam. He also carried out geological field work in parts of Kutch and examined in detail the Mesozoic and Tertiary successions.

Positions: Palaeontologist, Assam Oil Company Ltd., Digboi, Assam.

Author/Editor Facet: Nagappa's many works could not get into print as they were the private property of Burma Oil Ltd. However, his book 'Geological History of India' (in Kannada) was published (1940) by University of Mysore.

Died 30 October 1960.

NAGARAJAN, Kuppuswamy *Elected 1977*

Born 15 September 1930; Sirupalai, Tamil Nadu
Ph.D. (1954), University of Madras

Specialization: Organic Chemistry

Research Achievements: Nagarajan's interests are in natural products, medicinal heterocyclic chemistry, pesticide chemistry and nuclear magnetic resonance spectroscopy. He has discovered several novel reactions and eluciated their mechanisms. Developed a number of new drugs, one of which, Sintamil, is marketed in India; also developed many new processes for drugs and pesticides, one example being a process for the life-saving drug azathioprine.

Positions: Director, R&D, Bangalore Pharmaceuticals & Research Laboratory (P) Ltd (1992-); Director, R&D, Searle India, Bombay (1984-92); Head, Medicinal Chemistry, Ciba Research Centre, Bombay (1963-84).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Maharashtra Academy of Sciences; Invited Member, New York Academy of Sciences; President, Indian Chemical Society (Bombay Chapter).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1974).

Lectureships: Professor K. Venkataraman Endowment Lecture (University of Bombay); Professor Shah Endowment Lecture (University of Bombay); Professor Sethna Endowment Lecture (M.S. University of Baroda); Chevalier Machado Endowment Lecture (Madurai Kamaraj University).

Author/Editor Facet: Served as a member of the editorial boards of *J. Sci. Industr. Res.*, *Indian J. Chem.*, *Med. Arom. Plant. Abstr.*, *Proc. Indian Acad. Sci. (Chem. Sci.)*; *Proc. Indian Nat. Sci. Acad. (Pt A)*; contributed a chapter to 'Progress in Drug Research' (Elsevier).

Other Contributions: Nagarajan is largely responsible for the development of CIBA research centre and R&D centres of Searle India Ltd. and Bangalore Pharmaceuticals & Research Laboratory (P) Ltd.

Address: Director, R&D, Bangalore Pharmaceuticals & Research Laboratory (P) Ltd, 9th Block, Jayanagar, Bangalore 560 069, Tel: (080) 641207, 641795; Telex: 0845-3101 'BPRL' IN; Fax: 91-80- 610407; Res: 'Sandhya Savera', No.6, 5th 'C' Cross, IAS Colony, II Stage, B.T.M. Layout, Bangalore 560 076; Tel: (080) 631928.

NAGENDRA NATH, Nagesh Subbarao

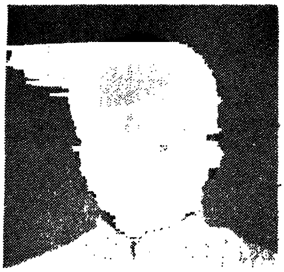
Elected 1959

Born 10 May 1912
Ph.D., University of Cambridge, UK

Specialization: Optics, Ultrasonics, Crystallography

Research Achievements: After a distinguished career as a student and worker at IISc, Bangalore, Nagendra Nath went to Cambridge (UK) as the first Indian 1851

Exhibition scholar. At Bangalore and Cambridge, he brought in specialized methods to solve fundamental problems of physics. His pioneering work on now well- known ultrasonics and their diffraction by other waves was done by integro-differential equations (then essentially new) and gave specific points of experimental verification. On nutrino theory of light he did extensive work with Max Born. He published both independently and in collaboration with C.V. Raman, Max Born, Hans Muller and F. Levi. His work has been widely quoted.



Positions: Professor and Head, Department of Mathematics, Science College, Patna University, Patna.

Learned and Professional Societies: Fellow, National Academy of Sciences (India) and Indian Academy of Sciences.

Died 1980.

NAHA, Kshitindramohan

Elected 1977

Born 2 January 1932; Comilla, Bangladesh
D.Sc. (1959), University of Calcutta

Specialization: Structural and Metamorphic Geology, Precambrian Geology

Research Achievements: Naha's contributions relate to: (i) time of formation and kinematic significance of deformation lamellae in quartz; (ii) geometry of reclined folds; (iii) large-scale architecture of migmatites; (iv) metamorphism in relation to stratigraphy, structure and movements in eastern Singhbhum and the Simla Himalayas; (v) revision of stratigraphy and structure in the Early Precambrian terranes of central Rajasthan and southern India; (vi) methods of recognizing angular unconformity in metamorphic terranes, with groups of rocks on either side of the unconformity involved in superposed folding; and (vii) methods of recognizing coaxial refolding prior to non-coaxial deformation.

Positions: CSIR Emeritus Scientist, Department of Geology & Geophysics; Professor of Geology, Assistant Professor of Geology (1962-71), all at Indian Institute of Technology, Kharagpur; Visiting Professor, University of California at Berkeley (1968); Senior Lecturer, La Trobe University of Victoria (1975-76).

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Life Fellow, Geological, Mining and Metallurgical Society of India (also Council Member), Geological Society of India (also Council Member); Member, INSA Council (1990-92).

Awards and Honours: S.L. Biswas Medal (Asiatic Society) (1958); National Mineral Award (1970); Shanti Swarup Bhatnagar Prize (1972); UGC National Lecturer (1978-79); Jawaharlal Nehru Fellow (1986-87).

Lectureships: Prof. K.P. Rode Memorial Lecture (Indian Science Congress) (1992); Prof. H.C. Dasgupta Memorial Lecture (Geological, Mining & Metallurgical Society of India) (1992); Dr S. Balakrishna Memorial Lecture (Andhra Pradesh Academy of Sciences) (1992).

Author/Editor Facet: Member, editorial boards of: *Indian J. Earth Sci., Indian J. Geol.* and *Precam. Res.*

Policy-making Bodies: Chairman, Indian National Committee on Continental Lithosphere.

Address: CSIR Emeritus Scientist, Department of Geology and Geophysics, Indian Institute of Technology, Kharagpur 721 302; Tel: (03222) 2221 - 2224, 4818; Telex: 6401-201 ITKG IN.

NAIDU, Purama Rangashayee Jagapathy

Elected 1963

Born 3 October 1903; Tiruchinapalli, Tamil Nadu
D. Phil. (1951), University of Basel, Switzerland

Specialization: Geology

Research Achievements: Naidu specialized in mineralogy and petrology. It was his hypothesis that (i) there is nothing like a rock called 'charnockite', which is not a hypersthene- granite; (ii) there.is nothing like an igneous consanguineous series of rocks called the 'Charnockite series', which have differentiated from the ultrabasic to the acidic end, and (iii) there is nothing like a province, called the 'Charnockite province' which is not at once a granite-gneiss-schist province.

Positions: Assistant Professor of Geology, Central College, Bangalore; Professor and Head, Department of Geology and Geophysics, University of Madras; Director, Centre for Advanced Studies in Geology, Panjab University, Chandigarh; Retired Professor of Geology (UGC), University of Mysore.

Learned and Professional Societies: Fellow, Mineralogical Societies of America and Switzerland, Geological Society of London; Member, Council, International Mineralogical Association (1962-64); Founder President (1959), Mineralogical Society of India.

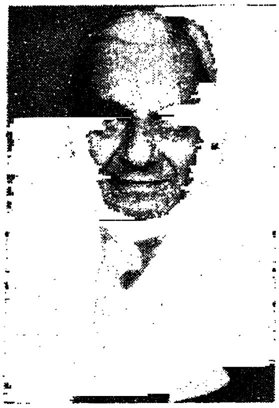
Awards and Honours: President, Geology and Geography Section, Indian Science Congress (1963).

Author/Editor Facet: Authored a book '4-Axes Universal Stage', which was hailed by peers as the best book on the subject in English language. It was largely due to the initiative of Naidu that Minerological Society of India he founded in 1959 started a new journal *Indian Mineralogist.*

Died 22 February 1970.

NAIK, Kuverji Gosai

Foundation Fellow



Born 1885
D.Sc. (1921), University of London, UK

Specialization: Organic Chemistry

Research Achievements: Naik's main contribution was to the chemistry of reactive methylene group.

Positions: Professor of Chemistry and Head, Department of Chemistry, Baroda College; Principal, Baroda College; First Rector, Gujarat University (1950).

Learned and Professional Societies: Member, Indian Chemical Society (sometime Vice-President).

Awards and Honours: President, Chemistry Section, Indian Science Congress (1931); Sir P.C. Ray Medal (1952).

The prestigious 'K.G. Naik Gold Medal' by M.S. University of Baroda was instituted in his memory.

Died 19 November 1974.

NAIR, Keshavan Raghavan

Elected 1957

Born 13 May 1910; Paravur, Kerala
D.Sc. (1954), University of London, UK

Specialization: Statistics

Research Achievements: Nair has made major contributions to the theory of design of experiments. Working with R.C. Bose, he introduced the concept of partially balanced incomplete block designs and worked out at length the methods of their construction and analysis. His work with C.R. Rao dealing with confounding in asymmetric factorial experiments is also considered highly significant. He also made significant contributions to order statistics.

Positions: Project Manager/Director, United Nations Asian Statistical Institute, Tokyo; Director, Central Statistical Organisation and *ex officio* Joint-Secretary, Department of Statistics, Government of India.

Learned and Professional Societies: Fellow, American Statistical Association and Royal Statistical Society (London); Member, International Statistical Institute; Member, INSA Council (1966- 68).

Address: 318/A, Block No. 8, Jayanagar, Bangalore 560 070; Tel: (080) 643973.

NAIR, Narayana Balakrishnan

Elected 1975

Born 6 July 1927; Perumbavoor, Kerala
Ph.D.(1955), D.Sc.(1965), University of Madras

Specialization: Aquatic Biology and Fisheries, Ecology, Conservation and Management of Aquatic Living Resources

Research Achievements: Nair has brought to light the taxonomy, functional morphology, embryology, reproductive biology, digestive physiology and ecology of organisms concerned with biodegradation of cellulose in aquatic habitats. Elucidated the biology of several species of shellfish and fin fish, their pathology and aquacultural techniques. Made noteworthy contributions to the ecology of tropical wetlands and their conservation;

and ecology of marine algae, mangrove and sea grasses. He is considered an expert on biodeterioration of cellulose materials in aquatic enviornment.

Positions: CSIR Emeritus Scientist (1991-); Dean, Faculty of Science (1976-78) and Head, Department of Aquatic Biology and Fisheries, University of Kerala (1968-80).

Learned and Professional Societies: Fellow, Zoological Society of London, Indian Academy of Sciences, National Academy of Sciences (India), Zoological Society of India, and Marine Biological Association of India; Founder Fellow, National Academy of Agricultural Sciences (India); Member, INSA Council (1978-80).

Awards and Honours: Chandrakala Hora Memorial Medal (INSA) (1988); Jawaharlal Nehru Fellowship (1982); Shanti Swarup Bhatnagar Prize (1971); UGC National Lecturer (1979); All India Congress of Zoology Gold Medal (1980); Padma Shri (1984).

Lectureships: Sir Subramonya Iyer Endowment Lecture (University of Madras) (1979).

Author/Editor Facet: Authored three books: 'Text Book of Marine Ecology' (MacMillan), 'Discovery of the Ocean' (NCERT), 'Paristhithivignanam' (Ecology) (Govt. of Kerala); chief editor, *Aqua. Biol.* (1980-86); member of editorial boards of 8 journals.

Policy-making Bodies: Chairman, Indo-Dutch Mission for the Kallada Environmental Action Programme (1991); Chairman, State (Kerala) Committee on Science & Technology and Environment; Secretary, Department of Science, Technology and Environment (Kerala) (1986-91).

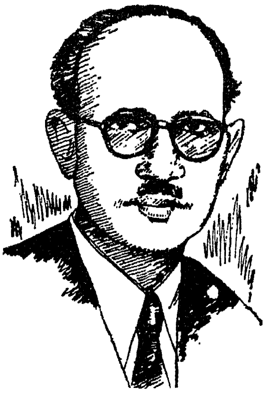
Other Contributions: Based on his report on 'Marine Resources Management in Kerala' the state government imposed the epoch- making "Ban on Monsoon Trawling", resulting in the conservation of the shrimp resources along the south-west coast of India.

Address: CSIR Emeritus Scientist, Department of Aquatic Biology and Fisheries, Beach P.O. Trivandrum 695 007; Tel: (0471) 450138; Res: 'Swathi', Residency Road, Thycaud, Trivandrum 695 014; Tel: (0471) 63746.

NAIR, Unni Sivaraman *Elected 1945*

Born 22 January 1904; Parur, Kerala
D.Sc. (1937), University of London, UK

Specialization: Statistics



Research Achievements: Nair made notable contributions to mathematics and statistics in relation to: (i) application of moment function in the study of distribution laws in statistics, (ii) probability statements regarding the ratio of standard deviations and correlation coefficient in a bivariate normal population, and (iii) application of factorial series in studying distribution laws.

Positions: Professor and Head, Statistics Division, Department of Mathematics, University of Travancore; Statistical Adviser, Government of Travancore; UN Statistical Adviser under ECAFE; Visiting Professor, University of California, USA.

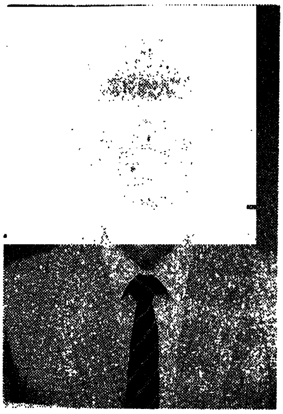
Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Died 8 August 1982.

NAKRA, Bahadur Chand

Elected 1987

Born 31 March 1939; Mianwali, Pakistan
Ph.D. (1966), University of London, UK



Specialization: Vibrations Engineering

Research Achievements: Nakra has made contributions to vibration analysis and control, especially in relation to the use of viscoelastically damped configurations. His current researches relate to dynamics of pneumatic systems, structural dynamic modification and condition-monitoring of rotating and reciprocating machines using signature analysis of vibrations, sound, acoustic intensity and process parameters.

Positions: Deputy Director, Faculty (1991-), Professor, Industrial Tribology, Machine Dynamics and Maintenance Engineering Centre (1983-84, 1985-87) and Instrument Design and Development Centre (1973-74), Head, Department of Mechanical Engineering (1975-78), Department of Mechanical Engineering (1971) all at Indian Institute of Technology, New Delhi.

Learned and Professional Societies: Fellow, Indian National Academy of Engineering, Institution of Engineers (India), and Acoustical Society of India.

Author/Editorial Facet: Published two books: 'Vibration Measurement and Analysis' (1989) and 'Instrumentation, Measurement and Analysis' (1985); served on the editorial boards of: *Tribol. Int., Maintenance.*; and of INSA publications.

Policy-making Bodies: Coordinator, Unesco Regional Coordination Programme in Engineering Education; Member, Indo-Norwegian Collaboration Programme on Tribology (1983- 86); Chairman, Indian National Committee for International Union for Theoretical Applied Mechanics.

Address : Professor, Department of Mechanical Engineering, Indian Institute of Technology, New Delhi 110 016; Tel: (011) 6862153; Telex: 31-61460 IITD IN, 31-73087 IITD IN; Fax: 91-11-6862037; Res: C-2, IIT Estate, Hauz Khas, New Delhi 110 016; Tel:(011) 656251.

NANDA, Janardan

Elected 1988

Born 15 August 1937; Cuttack, Orissa
Ph.D. (1964), Moscow Power Institute, Russia

Specialization: Electrical Power System Engineering

Research Achievements: Nanda's research contributions are in the analysis, stability, control, optimization and energy conservation aspects of power systems. He has pioneered and innovated many powerful techniques, models and computer softwares for large-scale integrated power systems studies, which are widely referred to by researchers and utilities alike all over the world.

Positions: Professor (1973-), Head (1984-87), Department of Electrical Engineering, Head and Dean (Undergraduate Studies, 1987-90), Indian Institute of Technology, New Delhi; Visiting Faculty, Imperial College of Science and Technology, London (1969-70); Professor, Department of Electrical Engineering, West Virginia University, USA (1978-79); Visting Professor, University of Auckland, New Zealand (1992); Visiting Professor, University of Clayton, Victoria, Australia (1993).

Learned and Professional Societies: Fellow, Institution of Engineers (India) and Indian National Academy of Engineering.

Awards and Honours: Pandit Madan Mohan Malaviya Gold Medal (Institution of Engineers, India) (1977-78); System Society of India Prize (1987, 1988, 1990, 1992).

Author/Editor Facet: Edited 'Recent Trends in Electric Energy Systems'(Prentice-Hall, 1987).

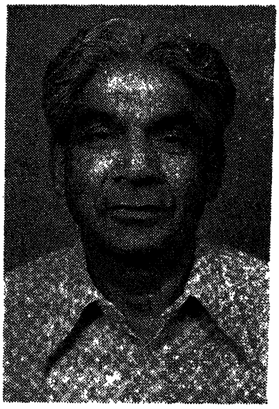
Policy-making Bodies: Member, Expert Group on Power System Technology, Union Ministry of Energy; National Committee on Electronics Applications in Thermal Power Plants, DOE; Programme Advisory Committee on Electricity and Power, DST; Member, Advisory Committee for Collaboration between Electrical Power Research Institute, USA, and Central Power Research Institute, India, on power system studies.

Other Contributions: Consultant to CEA, BHEL, NTPC, DESU and other state electricity boards.

Address: Professor, Department of Electrical & Computer System Engineering, Monash University, Clayton, Victoria 3168, Australia; Fax: (61) (3) 5653454; Telex: AA 32691; E-mail: durga@basil.eng.monash.edu.au

NANDA, Krishna Kumar

Elected 1973



Born 1 January 1918; Dadan Khan, Pakistan
Ph.D. (1947), University of Bombay

Specialization: Plant Physiology and Biochemistry

Research Achievements: Nanda studied the endogenous rhythms, the effect of light and temperature on correlations between reproductive development, growth pattern and plant yield to help develop crop-weather models for enhancing the yield. He was also engaged on problems of regeneration and floral bud initiation on woody plants including *in vitro* culture of shoot meristems to understand the physiology of regeneration, growth and reproductive determination.

Positions: Associate Professor, B.R. College, Agra (1960); Senior Research Officer, Plant Physiology, Forest Research Institute and Colleges, Dehra Dun (1960-63); Plant Physiologist, Indian Agricultural Research Institute, New Delhi (1966-68); Senior Professor of Plant Physiology, Department of Botany, Panjab University, Chandigarh (1968- 80); Emeritus Scientist, ICAR (1981-83).

Learned and Professional Societies: Member, Indian Botanical Society (President, 1982), Japanese Society for Plant Physiology, Indian Society of Plant Physiologists, Societia Physiology, Plantarum Scondinarice Cund, Indian Society for Tree Scientists, and American Association for Advancement of Science.

Awards and Honours: Rafi Ahmed Kidwai Memorial Prize (1972- 73); J.J. Chinoy Gold Medal (Indian Society of Plant Physiology) (1969, 1974); President, Botany Section, Indian Science Congress (1976-77); Birbal Sahni Medal (Indian Botanical Society) (1977); S.M. Sircar Memorial Medal (1979).

Author/Editor Facets: Served as Editor-in-Chief of *Indian J. Plant Physiol.* for 19 years.

Died 13 December 1983.

NANJUNDAYYA, Chandrasekhar

Elected 1959

Born 8 December 1904; Malvalli, Karnataka
Ph.D. (1949), University of Manchester, UK

Specialization: Applied Science, Textile Technology, Statistics

Research Achievements: Nanjundayya studied the structural properties of cotton fibre and cotton quality. He contributed to the development of control instruments, the most significant among them being the invention of a cotton stapling apparatus for determining the staple length and fineness of cotton. The apparatus had a global patent and had been used extensively in experimental stations. He was largely responsible for evolving new and improved varieties of Indian cotton. Studied the fine structure of fibres by X- ray diffraction.

Positions: Director, Cotton Technological Research Laboratory Bombay; and Founder Director, Bombay Textile Research Association; Project Manager, UNIDO, Alexandria, Egypt.

Learned and Professional Societies: Fellow, International Textile Institute (Vice-President, 1962-64) and Indian Standards Institution (now Bureau of Indian Standards).

Awards and Honours: International Textile Institute Medal (1969).

Other Contributions: Established a modern and well-equipped Textile Research Institute at Bombay; worked as a UNIDO expert and consultant in textiles.

Died 29 March 1987.

NAQVI, Sayed Mahmood

Elected 1986

Born 28 August 1941; Amroha, Uttar Pradesh
Ph.D. (1970), Aligarh Muslim University

Specialization: Precambrian Geology and Geochemistry

Research Achievements: Naqvi has worked on Precambrian geology of South India. He demonstrated field and laboratory evidence of primordial simatic crust, mostly made up of basic-ultrabasic lavas, and its transformation to the present-day sial during Early Archaean to Middle Proterozoic. He has found evidence for the lithostratigraphic division of the Dharwar supracrustal and Peninsular gneisses into five successive polymetallic interfingering groups. He has found, among others, that potassium-rich granites were seldom present on the crust before 2.6. billion years ago and that an intense K-metasomatic event had occurred before 3.0 billion years ago. Naqvi's works, in sum, have challenged the uniformitarian principle in geology on the basis of his detailed and integrated studies on the Indian shield. Recently Naqvi's work has shown the existance of life and photosynthesis as early as 3.0 Ga ago in the margins of Archaean oceans. He has proposed a mini plate model for Archaean with low angle subduction zone and sedimentary basin of moderate size to explain the tectono-depositional features of the Archaean greenstone belt.

Positions: Scientist, National Geophysical Research Institute, Hyderabad.

Learned and Professional Societies: Fellow, Geological Society of India, Geological Mining and Metallurgical Society of India and Indian Geophysical Union.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1983); Mysore Geologists Gold Medal (Geological Society of India) (1976); Andhra Pradesh Committee on Science and Technology Award (1989); National Mineral Award (1990-91).

Author/Editor Facet: Co-authored 'Precambrian Geology of India'; edited one book 'Precambrian Continental Crust and its Economic Resources' (Elsevier, 1990); co-edited four books, including 'Archaean Geology' (Elsevier 1978).

Policy-making Bodies: Member, International Committee on Peterozoic Geochemistry.

Address: Scientist E-II, National Geophysical Research Institute, Uppal Road, Hyderabad 500 007; Tel: (0842) 850141 (Ext 297); Telex: 0425-7018; Fax: 91-842-851564; Res: House VI/2, N.G.R.I. Colony, Uppal Road, Hyderabad 500 007; Tel: (0842) 850305

NARAIN, Hari

Elected 1981

Born 21 September 1922; Mainpuri, Uttar Pradesh
D.Phil.(1950), University of Allahabad; Ph.D.(1954) University of Sydney, Australia; D.Sc. *(h.c.)*, Indian School of Mines and Kakatiya University

Specialization: Earth Sciences - Geophysics

Research Achievements: Narain has determined the crustal structures through regional gravity studies of the eastern half of the Australia and carried out gravity, magnetic and seismic surveys for petroleum exploration. Studied surface waves, body waves and deep seismic sounding in parts of Himalaya for the first time to obtain a deeper insight into crustal structure and tectonics of the region. Carried out airborne geophysical surveys with indigenous facilities for the first time in India and interpreted data.

Positions: UNDP Chief Project Coordinator (1983-86); Vice- Chancellor, Banaras Hindu University (1978-83); Director, National Geophysical Research Institute, Hyderabad (1964-78); Surveyor General of India (Concurrently) (1972-76); Director, Institute of Petroleum Exploration, Oil & Natural Gas Commission (1962-64).

Learned and Professional Societies: Fellow, National Academy of Sciences (India) (President, 1979-80), Indian Geophysical Union (President, 1973-75), and Geological Society of India (Vice- President,1974-76); President, Earth Sciences Section, Indian Science Congress (1972).

Awards and Honours: UGC National Lecturer (1973); Padma Shri (1974).

Lectureships: Dr. A.M.N. Ghosh Memorial Lecture (1973); Prince Mukhramjah Lecture (1975); Professor S. Bhagavantam 60th Birthday Lecture (1976); Sir Thomas Henry Holland Memorial Lecture (1979); Acharya Hem Chand Das Gupta Centenary Lecture (1982); K.D. Malaviya Memorial Lecture (1988); Wadia Institute of Himalayan Geology Foundation Day Lecture (1992).

Policy-making Bodies: Member, International Geodynamics Commission, Group 6 - Alpine-Himalayan Region.

Other Contributions: Established institutes for petroleum exploration in ONGC and NGRI in Hyderabad. As a member of NCST (1971-77), he took an active part in the formulation of S & T plans for the natural resources sector ; as chairman of the Scientific Advisory Committee on Geosciences of Ministry of Petroleum, he helped in the development of R&D activities for petroleum exploration and exploitation.

Address: National Geophysical Research Institute, Uppal Road, Hyderabad 500 007; Tel: (0842) 851355, Telex: 0425-7018 NGRI IN; Fax: 91-842-854164; Res: 4-44/2, Vasant Vihar, Street No.8, Habshiguda, Hyderabad 500 007; Tel: (0842) 851084.

NARAIN, Prem

Elected 1978

Born 3 January 1934; Lucknow, Uttar Pradesh
D.Sc. (1984), University of Edinburgh, UK

Specialization: Statistical Genetics and Agricultural Statistics

Research Achievements: Narain's researches have opened up new vistas in the theory of genetics and their application to the breeding of domesticated plants and animals. He has also contributed to the theory and application of studies to crops, livestock and fisheries. He was instrumental in providing efficient statistical and computer techniques for agricultural research and development. Also developed a blueprint of KRISHINET -- a nationwide agricultural research information system.

Positions: Principal Scientist, Indian Agricultural Research Institute, New Delhi (1992-); Director (1981-92), Joint Director (1978-81), Senior Professor (1970-78), Indian Agricultural Statistics Research Institute, New Delhi.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India) and National Academy of Agricultural Sciences (India) (currently Treasurer), Royal Statistical Society (UK); Council Member, International Biometric Society, USA (1988-91); President, Indian Society of Agricultural Science; Secretary-General, Federation of Indian Societies of Agricultural Sciences and Technology; Secretary, Indian Society of Agricultural Statistics.

Awards and Honours: Rafi Ahmed Kidwai Memorial Prize (1977); G.P. Chatterji Memorial Lecture Award (INSA) (1987); Sankhyiki Bhushan Award (Indian Society of Agricultural Statistics) (1991); Om Prakash Bhasin Foundation Award (1992).

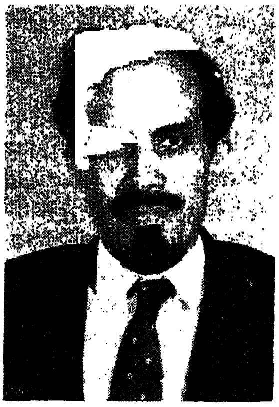
Author/Editor Facet: Authored a book 'Statistical Genetics' (Wiley Eastern, 1990); chairman of editorial board of *J. Indian Soc. Agri. Stat.*; corresponding editor of *J. Proc. Roy. Soc. Lond., Ser. B.*

Policy-making Bodies: International Statistical Institute (Netherlands) (1989-93).

Address: Principal Scientist, Indian Agricultural Research Institute, Pusa, New Delhi 110 012; Tel: (011) 5782817; Telex: 031-77161 IARI-IN; Fax: 91-11-5740722; Res: B-5 IARI Campus, New Delhi 110 012; Tel: (011) 5788770.

NARASIMHA, Roddam

Elected 1979



Born 20 July 1933; Bangalore, Karnataka
Ph.D. (1961), California Institute of Technology, USA

Specialization: Fluid Mechanics, Aerospace Engineering, Atmospheric Sciences

Research Achievements: Narasimha is the author of the model for fluid flow in the transition zone of a boundary layer, widely used in the aircraft and turbomachine industry. He has made a definitive study of re-laminarization of turbulent flows. Defined the concept of a light combat aircraft now under realization. Also made lasting contributions to rarefied gas dynamics, a field of relevance to flight in the upper atmosphere. In particular, his studies of the structure of strong shock waves in supersonic flows have provided several novel approaches in the field.

Positions: Director, National Aerospace Laboratories, Bangalore (1984-); Professor, Department of Aerospace Engineering and Centre for Atmospheric Sciences, Indian Institute of Science (IISc), Bangalore (1970-); Professor, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore (1989-); INSA Golden Jubilee Research Professor (1991-95); Clark B. Millikan Visiting Professor, California Institute of Technology, USA (1985-); Jawaharlal Nehru Visiting Professor, University of Cambridge, UK (1989-90); Dean, Engineering Faculty (1980-82) and Chairman, Department of Aerospace Engineering (1983-84), IISc; Chief Project Coordinator, Hindustan Aeronautics Ltd (1977-79);

Learned and Professional Societies: Fellow, Indian Academy of Sciences (President, 1992), Indian National Academy of Engineering, Third World Academy of Sciences, Royal Society of London, American Institute of Aeronautics & Astronautics (USA); Foreign Associate, National Academy of Engineering (USA); Hony Fellow, Aeronautical Society of India; Member, INSA Council (1984-86).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1976); Homi Bhabha Award (UGC) (1976); Sherman Fairchild Caltech Distinguished Scholar (1982-83); Shanti Swarup Bhatnagar Medal (INSA) (1985); Kannada Rajyotsava Award

(1986); Caltech Distinguished Alumnus (1986); IISc Distinguished Alumnus (1988); Gujar Mal Modi Award (1990); Padma Bhushan (1987).

Lectureships: Vikram Sarabhai Memorial Lecture (1991); C.V. Raman Memorial Lecture (1986); Nilakantan Memorial Lecture (1985); and several keynote addresses/inaugural lectures at international conferences.

Author/Editor Facet: Chairman, editorial board of *Sadhana* (1976-91); member of editorial boards of: *Exper. Fluids* (Springer) and *Fluid Dynam. Res.* (North-Holland); edited three books.

Policy-making Bodies: Member, General Assembly of International Union of Theoretical and Applied Mechanics (IUTAM); Chairman (1993-), Asian Fluid Mechanics Committee; Executive Delegate from India, Commonwealth Advisory Aeronautical Research Council (1983-); Member, Space Commission (1989-), and of several boards.

Other Contributions: As chairman of the first LCA team, Narasimha led the initial design studies leading to the conceptualization of the Light Combat Aircraft. Formulated the design concept of the hypersonic tunnel at IISc and led the project till 1985. Was also instrumental in establishing a Centre for Atmospheric Sciences at IISc. Co-founder of Asian Congress of Fluid Mechanics; founder of *Sadhana*. At NAL, he has promoted the use of parallel computing and the design and construction of small aircraft for civil aviation.

Address: Director, National Aerospace Laboratories, Post Bag No. 1779, Kodihalli, Bangalore 560 017; Tel: (080) 570584, 565579; Telex: 0845-2279 NAL IN; Fax: 91-80- 560862, 570670; Cable: NAEROLAB; E-mail: viman@sirnetb.ernet.in (or) roddam@cas.iisc.ernet.in; and Department of Aerospace Engineering & Centre for Atmospheric Sciences, Indian Institute of Science, Bangalore 560 012; Tel: (080) 340450, 344411; Res: 72, Jaladarshini Layout, Rajmahal Vilas (II Stage), Bangalore 560 094; Tel: (080) 332705.

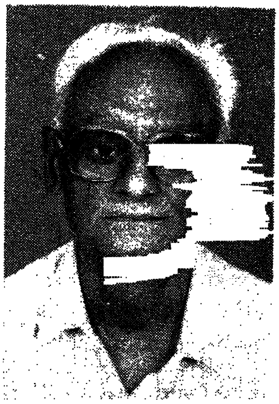
NARASIMHAM, Nishtala Appala

Elected 1971

Born 15 August 1922; Parlakemidi, Orissa
Ph.D. (1952), Banaras Hindu University, Varanasi

Specialization: Atomic and Molecular Physics, Spectroscopy and Astrophysics

Research Achievements: Narasimham has done extensive work on high resolution spectra of molecules of astrophysical importance, e.g. P_2,NH,NS,PS,PO,SO and S_2 and ions O_2^+,P_2^+, PH^+ and PD^+. Discovered the missing lines of $S_2((3\pi_g - 3\varepsilon_\upsilon^+))$ to be antisymmetric rotational lines, thus establishing the nuclear spin of ^{34}S to be



zero. Obtained diffuse bands in the electronic emission spectra of xenon and krypton halides which are found to be intense sources of laser emission in the much- desired ultraviolet region. His other studies relate to laser spectroscopy and laser spectroscopic techniques for trace analysis and X-ray spectroscopy and atomic spectra of rare-earth ions in crystalline matrice and garnets.

Positions: Head, Spectroscopy Division, Bhabha Atomic Research Centre, Bombay; Head, Analysis Group and Spectroscopy Group, BARC (1957-82); INSA Senior Scientist (1985-87).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Maharashtra Academy of Sciences; Foundation Fellow, Andhra Pradesh Academy of Sciences; Member, American Physical Society, Optical Society of America, and American Association for the Advancement of Science; Member, INSA Council (1981-82).

Awards and Honours: Plaque and Citation (Instrument Society of India) (1983); Sir C.V.Raman Birth Centenary Medal (1988); K. Rangadhama Rao Memorial Lecture (INSA) (1983).

Lectureships: Sanjeeviah Memorial Lecture (Sri Venkateswara University) (1990); Silver Jubilee Lecture (Andhra Pradesh Academy of Sciences) (1988).

Author/Editor Facet: Edited and published 'Invited Talks: International Conference on Spectroscopy' (Tata Press Ltd., 1968); member of editorial boards of: *Pramana* (1982-90), *Indian J. Phys.* (1989-).

Policy-making Bodies: Member, IUPAP Commission C-15, on Atomic and Molecular Physics and Spectroscopy (1981-87).

Address: 18, Saras Baug, Deonar, Bombay 400 088; Tel: (022) 5519721.

NARASIMHAN, Mudumbai Seshachalu

Elected 1971

Born 7 June 1932; Thandarai, Tamil Nadu
Ph.D.(1960), University of Bombay

Specialization: Algebraic and Differential Geometry, Analysis

Research Achievements: Narasimhan has contributed to algebraic geometry and theory of vector bundles on curves and higher dimensional varieties. His work in

differential geometry pertains to theory of connections and guage theory; in Lie groups, to the concrete realization of the discrete series representations; in analysis, to a theorem characterizing real analytic functions in terms of powers of an elliptic operator.

Positions: Director of Mathematics, International Centre for Theoretical Physics, Trieste; Professor of Eminence, Senior Professor, Professor, School of Mathematics, Tata Institute of Fundamental Research, Bombay.

Learned and Professional Societies: Fellow, Third World Academy of Sciences and Indian Academy of Sciences; Member (sometime), Executive Committee, International Mathematical Union; Vice- President, International Centre for Pure and Applied Mathematics, Nice; Member, INSA Council (1977-79).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1975); Meghnad Saha Award (1978); Srinivasa Ramanujan Medal (INSA) (1988); Third World Academy of Sciences Award (1987), Chevalier de l'ordre du Merite, France (1989); Padma Bhushan (1988).

Author/Editor Facet: Editor of *Int. J. Math.*

Policy-making Bodies: First Chairman, National Board for Higher Mathematics; Chairman, Commission on Development and Exchange of International Mathematical Union.

Address: Director of Mathematics, International Centre for Theoretical Physics, P.O. Box 586, I-34100, Trieste, Italy; Tel: (040) 22401; Fax: (040) 224163; E-mail: narasim@ictp.trieste.it

NARASIMHAN, Nurani Sivaramakrishna *Elected 1987*

Born 11 November 1928; Nurani, Kerala
Ph.D.(1954), University of Madras

Specialization: Organic Chemistry -- Synthesis, Mechanism and Natural Products

Research Achievements: Narasimhan has made an in-depth study of organolithiation reactions with respect to both mechanism and synthetic utility. Developed new methods for the synthesis of several heterocyclic ring systems, which provide short and efficient routes to compounds not readily synthesized by other methods. His classic achievements are syntheses of natural products, isocoumarins, furoquinolines and benzophenanthridines. His other significant achievements include syntheses of: (i) lignan lactones, pyridinocarbazole alkaloids and steroidal hormones using pericyclic reactions; (ii) staganone, an anticancer compound, and the spiro-structure present in fredricamycin, another anticancer compound, using radical- mediated reactions, and (iii) cordrastine, cherylline and latifine, anibine, shihunine and catalpalactone. He determined the structure of carpaine (from *Carica papaya)* , and nimbin (from *neem* bark). Elucidated the structure of mahanimbine, koenimbine, etc. (alkaloids from *Murraya koenigii).*

Positions: Professor and Head, Department of Chemistry, University of Poona, Pune; INSA Senior Scientist (1989-92); Visiting Professor, University of Alberta, Canada (1980) and Southern Methodist University, Dallas, USA (1988).

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: T.R. Govindachari 60th Birthday Commemoration Award (University of Madras) (1984); UGC National Lecturer (1985- 86).

Lectureships: Professor R.C. Shah Memorial Lecture (University of Bombay) (1986).

Address: Emeritus Professor, Department of Chemistry, University of Poona, Pune 411 001; Res: 22, Niyoshi Part II, Aundh, Pune 411 007; Tel: (0212) 335178.

NARASIMHAN, Palliakaranai Thirumalai

Elected 1972

Born 28 July 1928; Cuddalore, Tamil Nadu
Ph.D. (1955), University of Madras

Specialization: Theoretical Chemistry, Magnetic Resonance

Research Achievements: Narasimhan's research achievements relate to: quantum chemical studies on molecular systems with special reference to interpretation of magnetic resonance parameters such as nuclear spin couplings in NMR, spin densities in ESR and nuclear quadrupole coupling constants; magnetic susceptibility and nuclear shielding;

Sternheimer shielding and exchange correlation in atoms and ions using local potential based (Hartree-Fock-Slater HFS) wave functions; electron momentum distribution in atoms and ions (using HFS) and in molecules (using valence bond and molecular orbital wave functions); design and development of X-band Overhauser effect spectrometer and quantum chemical interpretation of differential Overhauser enhancements; and design and development of phase-locked CW and pulsed and double resonance NQR spectrometers.

Positions: Professor, Department of Chemistry, Indian Institute of Technology, Kanpur (Retired).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India) (President, Physical Sciences Section 1977), Association of Magnetic Resonance Spectroscopists (India) (President), and International Society of Magnetic Resonance (USA) (Council Member).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1970); J.C. Ghosh Memorial Medal (1972); Sir C.V. Raman Award (Hari Om Ashram Trust, UGC) (1980); President, Chemistry Section, Indian Science Congress (1975); Professor R.K. Asundi Memorial Lecture Award (INSA) (1986).

Author/Editor Facet: Co-edited 'A Hand-Book of Chemistry and Physics' (Aff. East West Pub. 1967).

Address: 975, San Pasqual St. 21 L Pasedana, CA 91106, USA.

NARASIMHAN, Rangaswamy

Elected 1975

Born 17 April 1926; Madras, Tamil Nadu
Ph.D. (1954), Indiana University, USA

Specialization: Computer Science

Research Achievements: Narasimhan's research interest lies in applying system-theoretic concepts and techniques to the study of behaviour and behavioural sciences. He is also interested in the role of science and technology in socio- economic change and development. Worked on visual data- processing, modelling language behaviour, role of science and technology on social change and technology policy issues.

Positions: CMC (Computer Maintenance Corporation) National Fellow, CMC Ltd, Bangalore; Professor of Eminence (Retired), (various positions earlier), Tata Institute of Fundamental Research, Bombay (1954-

90), Director, National Centre for Software Development & Computing Techniques, TIFR (1975-85); Visiting Scientist, Digital Computer Laboratory, University of Urbana, USA (1961-64).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Computer Society of India, and National Academy of Sciences (India).

Awards and Honours: Jawaharlal Nehru Fellowship (1971- 73);Homi J. Bhabha Award (UGC) (1976); Om Prakash Bhasin Foundation Award (1988); Padma Shri (1976).

Author/Editor Facet: Authored: 'Modelling Language Behaviour' (Springer-Verlag, 1981); edited special issue of *Curr. Sci.* on Artificial Intelligence (March 1993).

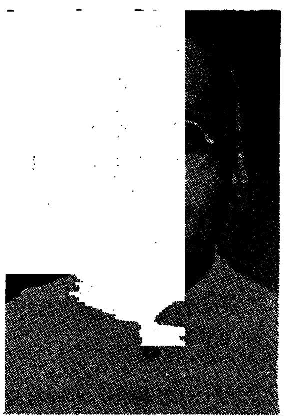
Policy-making Bodies: Indian Representative on Council of International Federation for Information Processing (1975- 86); Member, Scientific Advisory Council, Indo-French Centre for the Promotion of Advanced Research (1988-90).

Address: CMC National Fellow in Information Technology, CMC Ltd., Mithra Tower, 10/3 Kasturba Road, Bangalore 560 001; Tel: (080) 212425; Telex: 0845-2361; Fax: 91-80- 217189; Res: Flat 303, K.T. Apartments, No. 17, 89, Diagonal Road, Visvesvarapuram, Bangalore 560 004; Tel: (080) 627925.

NARAYAN, Appadvedula Lakshmi

Foundation Fellow

Born 1887; Mukkamala, Andhra Pradesh
D.Sc. (1924), University of Madras



Specialization: Physics - Spectroscopy

Research Achievements: Narayan was well known for his resourcefulness and creativity in fabricating apparatus for his research. He rigged up, for example, a small workshop in which he did his own glass-blowing for making gas discharge tubes. Made use of a single-stage vacuum pump and a mercury diffusion pump to create high vacua needed for his experiments. He used a dynamo coupled with a set of batteries for exciting arc spectra. In the case of spark spectra requiring high voltages of about 15,000 volts he used an induction coil. He constructed his own special Schumann photographic plates and equipped his laboratory with the components necessary for studying visible, ultraviolet and infrared spectra.

Positions: Deputy Director and Director (1929-47), Solar Physics Observatory, Kodaikanal; Principal, Maharajah College of Vizianagaram; Vice-Chancellor, Andhra University; Member, Andhra Pradesh Planning Commision.

Learned and Professional Societies: Fellow, Institute of Physics (London).

Awards and Honours: President, Physics Section, Indian Science Congress; Curzon Memorial Prize (Maharajah of Travancore).

Died 7 March 1973.

NARAYANA, Basudeva

Elected 1946

Born 19 November 1898; Saran, Bihar
Ph.D. (1934), University of Edinburgh, UK

Specialization: Physiology

Research Achievements: Narayana started his career with an experimental study of the action of insulin on normal and diabetic hearts. Later, he investigated factors causing variations in the blood diastase level in dogs, cats and rabbits as well as human beings. He found that the blood diastase level decreased after meals, on injection of glucose, glycogen and insulin, while it slightly increased after administration of anaesthetics and injection of starch. He showed that the pancreas was not the main source of blood diastase. He developed an improved kymograph, a research tool. He also studied the effect of evipan sodium on the heart and of drugs like ergotamine, adrenalin and pituitrin on the coronary vessels.

Positions: Professor of Physiology, P.W. Medical College, Patna (1935-46); Prinicipal and Dean, Faculty of Medicine (1946-52), Vice-Chancellor, Patna University (1954-57); Principal and Professor of Physiology, Bangaraya Memorial Medical College, Kakinada (1958-62); Hony Professor of Physiology, Patna University.

Learned and Professional Societies: Fellow, Royal Society of Edinburgh, and National Academy of Medical Sciences (India); Member, International Physiological Congress Association, British Physiological Society, and Medical Council of India (Vice- President 1960-65); Hony Life Member, Association of Physiologists and Pharmacologists of India.

Awards and Honours: President, Physiology Section, Indian Science Congress (1942).

Lectureships: Sukhraj Roy Readership Lecture (1951).

Author/Editor Facet: Prepared a report 'Medical Education in the USA and the UK, and Suggestions for Planning Medical Education in India' (1950) (unpublished).

Policy-making Bodies: Was associated with Scientific Advisory Board of Indian Council of Medical Research and with a large number of Committees set up by Government of India for Medical research and education.

Died 26 October 1967.

NARAYANAMURTI, Duraiswami

Elected 1940

Born 11 September 1904; Kumbakonam, Tamil Nadu

Dr. Ing.(1935), Technical University of Danzig (Gdansk), Poland

Specialization: Biochemistry and Wood Technology

Research Achievements: Narayanamurti's early scientific contributions were in biochemistry and a major part of his subsequent work was on wood science, composite wood and adhesives. He developed various types of plywood, handboard and particle board for industry, and special improved woods for defence aircrafts and railways. He was considered a pioneer in wood science and technology in the country.

Positions: Chief Research Officer, Composite Wood and Wood Preservation Branch; President, Forest Research Institute, Dehra Dun; Professor and Head, Division of Mechanical Technology and Director, Indian Plywood Industries Research Association, Bangalore; CSIR Emeritus Scientist and Principal Investigator, PL-480 Project, National Aeronautical (now Aerospace) Laboratory, Bangalore.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Royal Institute of Chemistry (London), Institute of Physics (London), Physical Society (London), and International Academy of Wood Science (Vienna); Member, Verein Deutsches Ingenieure (Berlin), Faraday Society (London), Kolloid Gesselschaft (Leipzig), Biochemical Society (London), Society of Biological Chemists (India), and Aeronautical Society of India (Council Member).

Awards and Honours: MBE (1944); Golden Jubilee Medal (Forest Research Institute) (1956).

Policy-making Bodies: Member, FAO Working Group on Wood Chemistry, International Committee on Rheology, and Commonwealth Composite Wood Corresponding Committee; Chairman, ISI Sectional Committee on Wood Products and Sports Goods.

Died 9 March 1975.

NARAYANAN, Ennapadam Sundara Ayyar *Elected 1958*

Born 15 February 1904; Palghat, Kerala
Ph.D. (1945), University of London, UK

Specialization: Zoology

Research Achievements: Narayanan's work covers almost all the subdisciplines of pure and applied entomology: taxonomy, morphology, anatomy, biology, parasitology, field control operations and biological control of insect pests and noxious weeds. As Director, Central Sericultural Research Institute, he was responsible for investigations in experimental genetics and manipulation and reshuffling of genes. These led to the evolution of several new races of silkworms with superior commercial characteristics.

Positions: Principal, Central College of Agriculture, New Delhi; Head, Department of Agriculture, Chairman and Dean, Faculty of Agriculture and Forestry, University of Delhi; Director, Central Sericultural Research and Training Institute, Chennapatna.

Learned and Professional Societies: Fellow, Royal Entomological Society (London), Entomological Society of India (President, 1952-58, 1960-62), Indian Academy of Sciences, and National Academy of Sciences (India).

Awards and Honours: President, Agricultural Sciences Section, Indian Science Congress (1957).

Author/Editor Facet: Served as chief editor of *Indian Bee J.;* chairman of editorial board of *Indian J. Sericul.*

Died 23 January 1991.

NARLIKAR, Anant Vishnu *Elected 1993*

Born 31 March 1940; Kolhapur, Maharashtra
Ph.D. (1965), Cambridge University, UK

Specialization: Superconductivity

Research Achievements: Narlikar has shown the importance of non- uniform dislocations in causing vortex pinning in conventional Nb-based superconductors. He has done work on the growth and ordering of A-15 layers by solid-state reactions, conduction- electron spin resonance, substitutional effects in high T_C cuprate systems, and scanning/tunnelling microscopy of fullerenes and cuprates.

Positions: Scientist G, National Physical Laboratory, New Delhi (1973-); Professor and Head, Physics Department, Shivaji University, Kolhapur (1969-72).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India).

Awards and Honours: A.N. Chatterjee Gold Medal (Indian Cryogenic Council) (1977); Materials Research Society of India Award (1991).

Author/Editor Facet: Edited 10 volumes of the series: 'Studies of High-Temperature Superconductors', editor of the book series 'Studies of High Temperature Superconductors (both of Nova Science, New York).

Address: Scientist G, National Physical Laboratory, Dr K.S. Krishnan Road, New Delhi 110 012; Tel: (011) 5786087; Telex: 031- 77099 NPL IN, 031-77384 RSD IN; Fax: 91-11- 5752678; Res: DII/12, NPL Colony, New Rajinder Nagar, New Delhi 110 060; Tel: (011) 5749872.

NARLIKAR, Jayant Vishnu *Elected 1977*

Born 19 July 1938; Kolhapur, Maharashtra
Sc.D. (1976), University of Cambridge, UK; D.Sc.*(h.c.)* (1991), University of Burdwan

Specialization: Cosmology & Gravitation, High-Energy Astrophysics

Research Achievements: Narlikar's early work provided a scalar field formulation of the steady-state universe. More recently Narlikar, along with Fred Hoyle and Geoffrey Burbidge has revived that work as a serious alternative to the hot big bang cosmology. He and Hoyle have a programme of describing action-at-a-distance electrodynamics, quantum as well as classical, and have extended the ideas to propose a Machian theory of gravity. Narlikar has stretched this theory to account for the observed redshift anomalies in quasars and galaxies. He has also done pioneering work in quantising the conformal degree of freedom and using the framework to construct non-singular models in quantum cosmology.

Positions: Director, Inter-University Centre for Astronomy and Astrophysics, Pune (Hony 1988-89, Full-time 1989-); Hony Professor (1989-92), Senior Professor (1983-89), Professor (1972-83), Tata Institute of Fundamental Research, Bombay; Staff Member, Institute of Theoretical Astronomy, University of Cambridge, UK (1966-72); Fellow, King's College, Cambridge (1963-72).

Learned and Professional Societies: Fellow, Royal Astronomical Society (London), Cambridge Philosophical Society, Indian Academy of Sciences (sometime Council Member), National Academy of Sciences (India), and Maharashtra Academy of Sciences; Founder Member, Indian Association for General Relativity and Gravitation (President, 1982-84) and Astronomical Society of India (President, 1982-85); Member, Indian Physics Association, Marathi Vidnyan Parishad (President, 1991-94); Associate, Royal Astronomical Society, London; Corresponding Fellow, Third World Academy of Sciences; Hony Fellow, The Institution of Engineers (India); Member, INSA Council (1987-88).

Awards and Honours: Adams Prize (University of Cambridge) (1965); Jawaharlal Nehru Fellowship (1973-75); Golden Jubilee Gold Medal (Institute of Science, Bombay) (1973); Shanti Swarup Bhatnagar Prize (1978); Distinguished Service Award (Mathematical Association of India, Delhi Chapter) (1987); Durga Prasad Khaitan Memorial Medal (Asiatic Society) (1987); INSA - Vainu Bappu Memorial Award (1988); Indira Gandhi Award for Popularization of Science (INSA) (1990); Hony Professor, Jawaharlal Nehru Centre for Advanced Studies (1990); Dr. V.M. Gogate Award (1992), FICCI Award (1991-92); several awards for science popularization in Indian languages; Padma Bhushan (1965).

Lectureships: Friday Evening Discourse (Royal Institution of Great Britain); Tenth Jawaharlal Nehru Memorial Lecture; Third Vikram Sarabhai Memorial Lecture (Institution of Engineers, Bombay); Visvesvaraya Memorial Lecture (Institution of Engineers, Pune); Eighteenth Founder Memorial Lecture (Shri Ram Institute for Industrial Research); G.C. Sen Memorial Lecture (Jadavpur University); IISc Plantinum Jubilee Lecture; S.N. Bose Lecture (Indian Physical Society; P.L. Bhatnagar Memorial Lecture (Indian Mathematical Society, Pune); S.K. Mitra Centenary Memorial Lecture (Institute of Radiophysics, Calcutta).

Policy-making Bodies: Member, Indo-US Subcommission on Education and Culture, Science Advisory Council to the Prime Minister, IAU Cosmology Commission, IUPAP Astrophysics Commission, Organizing Committee of Commission 47 on Cosmology of IAU (Vice-President, 1991-94), and Commission C- 19 on Astrophysics of IUPAP.

Other Contributions: Narlikar is an acknowledged science popularizer in Hindi, English and Marathi. His science fiction story 'Dhumaketu' has been made into a film by Children's Film Society.

Address: Director, Inter-University Centre for Astronomy and Astrophysics, Post Bag 4, Ganeshkhind, Pune 411007; Tel: (0212) 336415 (Ext 201, 204); Telex: 0145 7658 GMRT IN; Fax 91-212- 335760; E-mail: Jayant@iucaa.ernet.in; Res: 1, Akashganga, IUCAA Housing Colony, Poona University Campus, Pune 411 007; Tel: (0212) 339669, 336415 (Ext 237).

NARLIKAR, Vishnu Vasudeva

Elected 1939

Born 26 September 1908; Kolhapur, Maharashtra
M.A. (1946), University of Cambridge, UK

Specialization: Mathematics, Relativity, Cosmology

Research Achievements: Narlikar specialized in relativity and cosmology. His significant research achievements include: a generalization of Bode's law; derivation of the highest atomic number in Eddington's fundamental theory; derivation of world trajectories in Milne's kinematical relativity; studies of the gravitational space-time matrices, their fourteen differential invariants, exact solutions and equations of fit; developments in the Einstein-Infeld-Toffmann equations of motion; and solution of Einstein- Schrodinger type of unified field theory equations.

Positions: Professor and Head, Department of Mathematics (1932- 60); Pro-Vice-Chancellor (1950-55), Principal, Central Hindu College (1958-60), Banaras Hindu University, Varanasi; Lokmanya Tilak Professor of Applied Mathematics, University of Poona (1966-73); Emeritus Professor, Banaras Hindu University, (1963) and University of Poona (1973).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), and Royal Astronomical Society (London); President, Calcutta Mathematical Society (1957-59), Indian Association of General Relativity and Gravitation (1970), and Indian Mathematical Society (1982); Member, INSA Council (1942-44).

Awards and Honours: Raleigh Prize (University of Cambridge) (1932); President, Mathematics Section, Indian Science Congress (1953).

Other Contributions: Narlikar served as Chairman, Rajasthan Public Service Commission.

INSA has instituted 'Professor Vishnu Vasudeva Narlikar Memorial Lecture Award'.

Died 1 April 1991.

NASIPURI, Dhanonjay

Elected 1978

Born 1 April 1925; Shitalgram, West Bengal
D.Sc. (1964), University of Calcutta

Specialization: Synthetic and Mechanistic Organic Chemistry and Organic Stereochemistry

Research Achievements: Nasipuri developed new reagents for diastereoselective reduction of cyclic ketones almost exclusively to the less stable epimeric alcohols and also new chiral reagents for enantioselective reduction of prochiral ketones and aldehydes with moderate to high enantiomeric excess. Determined the energy barrier to rotation around aryl-carbon and aryl- nitrogen bonds by dynamic nuclear magnetic resonance spectroscopy. Developed a new biomimetic method for the synthesis of naturally occurring diterpenes and sesquiterpenes such as sugiyl methyl ether, nimbiyl methyl ether, xanthoperol, and pallescensin A.

Positions: Chairman, Department of Chemistry, Indian Institute of Technology, Kharagpur; Visiting Professor, Faculty of Forestry, Toronto University Canada; Leverhulme Visiting Fellow, University of New South Wales, Australia; Senior Royal Society Fellow, University of Oxford, England; Visiting Scientist, University of North Carolina, USA.

Learned and Professional Societies: Fellow, Royal Society of Chemistry (England), Indian Academy of Sciences, and Indian Chemical Society.

Awards and Honours: UGC National Lecturer (1984).

Lectureships: Basudev Memorial Lecture (1962); Principal Khudiram Bose Memorial Lecture (University of Calcutta); Adhar Chandra Mukherjee Memorial Lecture (University of Calcutta).

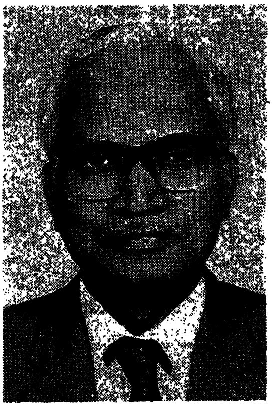
Author/Editor Facet: Authored an advanced textbook 'Stereochemistry of Organic Compounds: Principles and Applications'; hony editor, Indian Chemical Society (for two years).

Other Contributions: Nasipuri established a school of organic stereochemistry for the first time in India.

Address: 46, Surendranath Housing Society, 238 Manicktala Main Road, Calcutta 700 054; Tel: (033) 361061.

NATARAJAN, Paramasivan

Elected 1988



Born 17 September 1940; Madras, Tamil Nadu
Ph.D. (1971) University of Southern California, USA

Specialization: Inorganic Photochemistry, Photophysics of Coordination compounds, Laser Flash Photolysis, Photochemistry of Macromolecules, Photoelectrochemistry, Radiation Chemistry, Pulse Radiolysis

Research Achievements: Developed electrode materials of polymeric dyes which show a new type of protoelectrochemical behaviour having applications in solar energy conversion and switching devices. Established a modern laboratory to investigate flash photolysis behaviour of molecules.

Positions: Director, Central Salt & Marine Chemicals Research Institute, Bhavnagar (1991-); Professor and Head, Department of Inorganic Chemistry, University of Madras, Madras (1991-92); Professor and Head, Department of Chemistry, University of Madras Post-graduate Centre, Tiruchirapalli (1977-82); Visiting Professor, Radiation Laboratory, University of Notre Dame, USA (1979-80; 1987-88); Visiting Scientist, Institut de Chimie Physique Ecole Polytechnique Federale, Lausanne, Switzerland (1983).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Tamil Nadu Academy of Sciences;Member, New York Academy of Sciences.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1984); Best Teacher Award (Tamil Nadu Government) (1984); UGC National Lecturer (1986-87); UGC National Fellow (1989-91).

Lectureships: Machado Endowment Lectures (Madurai Kamaraj University) (1987); Lourdou Yeddanapalli Memorial Lecture (University of Madras).

Author/Editor Facet: Member, editorial boards of: *Indian J. Chem.* (1986-91) and *Proc. Indian Acad. Sci.* (1986-89).

Policy-making Bodies: Member Photochemistry Commission, IUPAC (1986-93).

Other Contributions: Member, Project Advisory Committee, DST (1980-88, 1991-94); UGC Panel (1988-90) and Inorganic and Physical Chemistry, Research Committee, CSIR (1987-91).

Address: Director, Central Salt & Marine Chemicals Research Institute, Gijubhai Badheka Marg, Bhavnagar 364 002; Tel: (0278) 29496; Telex: 0182-230 ABC SALT IN; Fax: 91-278- 26970; Gram: NAMAK, Bhavnagar 364 002; E-mail: root%CSMCRI@sirnetd.ernet.in; Res: Director's Bungalow, CSMCRI Quarters, Hill Drive Road, Bhavnagar 364 002; Tel: (0278) 27039.

NATH, Indira

Elected 1992

Born 14 January 1938; Guntur, Andhra Pradesh
M.D. (1969), All India Institute of Medical Sciences, New Delhi;
MRC (Path.) (1983), Royal College of Pathologists, UK

Specialization: Immunology

Research Achievements: Nath's main achievements are in cellular immunology with special reference to local problems. She and her coworkers evaluated immune responses in undernutritional states in experimental and human models, in individuals and primates immunized with antifertility vaccine involving HCG, and in infectious diseases such as tuberculosis and leprosy. They investigated immunoregulatory events in human leprosy using frontline technologies. Using both the natural *M. leprae* antigens and a unique recombinant antigen, LSR, which they identified, immune perturbation in leprosy patients was defined. They have identified B cell epitopes of LSR, which are uniquely recognized by the sera of ENL patients.

Positions: Professor and Head, Department of Biotechnology (1987-), Associate Professor (1986-87), Assistant Professor (1980-86); Department of Pathology, Lecturer, Department of Biochemistry (1972-80), All India Institute of Medical Sciences, New Delhi.

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Indian Academy of Sciences, Royal College of Pathologists (London), and National Academy of Medical Sciences (India); Life Member, Indian Association of Leprologists; Founder Life Member, Indian Immunology Society; Elected Fellow, College of Allergy and Applied Immunology; Member, Indian Association of Pathologists and Micro- biologists.

Awards and Honours: Dr Nitya Anand Endowment Lecture Award (INSA) (1987); Kshanika Oration Award (ICMR) (1984); ICMR- JALMA Trust Fund Oration Award (1981); Shanti Swarup Bhatnagar Prize (1983); Om Prakash Bhasin Foundation Award (1990).

Lectureships: Clayton Memorial Lecture (London School of Tropical Medicine).

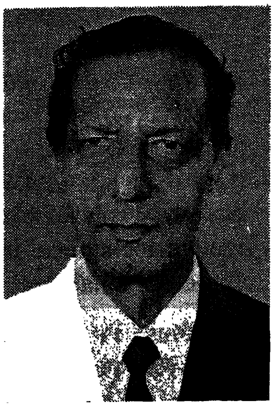
Author/Editor Facet: Contributed chapters to 7 books; four in preparation; associate editor of *Indian J. Leprosy* and *Asian Pacific J. Aller. Immunol.*; chairman, editorial board, *AIIMS News*.

Other Contributions: Member, research council, Central Drug Research Institute, and scientific advisory committees of many ICMR institutes, WHO and of DBT.

Address: Professor & Head, Department of Biotechnology, All India Institute of Medical Sciences, New Delhi 110 029; Tel: (011) 6852286, 661123/453; Res: C3/10, Safdarjang Development Area, New Delhi 110 016; Tel: (011) 665977, 6851504.

NATH, Madhab Chandra

Elected 1950



Born 23 October 1905; Dacca, Bangladesh
D.Sc. (1937), University of Dacca

Specialization: Physiology, Biochemistry, Pharmacology and Nutrition

Research Achievements: Nath isolated a steroidal crystalline compound, known as 'artostenone', from the latex of jackfruit and determined its structure. He showed that a fat metabolite such as acetoacetate can cause symptoms of diabetes thus accounting for a greater incidence of this disorder in fatty people and in those taking a high-saturated fat diet. He also showed that acetoacetate causes symptoms of atherosclerosis with the thickening of arteries, increase in blood platelets and lowering of blood clotting time. Glucose cycle, acetoacetate and its hydrolysate, he found, could bring about relief both in experimental diabetes and atherosclerosis.

Positions: Founder Professor and Head, Department of Biochemistry, Nagpur University (1946-71); UGC Retired Professor (1971-73).

Learned and Professional Societies: Fellow, Royal Institute of Chemistry (London) and Indian Institution of Chemists; Member, Society of Biological Chemists (India), Society for Experimental Biology & Medicine (USA), and American Association for the Advancement of Science.

Awards and Honours: Elliot Prize (Asiatic Society) (1942); G.J. Watumull Foundation Research Award (1946) President, Physiology Section, Indian Science Congress (1965).

Author/Editor Facet: Wrote a book 'Science and Philosophy of Life' (1981).

Other Contributions: Nath took great interest in Bengali Education Society of which he was President or Vice-President for over a decade (1947-57).

Died 10 January 1990.

NAYAK, Nabeen Chandra

Elected 1988

Born 21 January 1931; Puri, Orissa
M.D. (1956), University of Lucknow

Specialization: Medical Science, Pathology

Research Achievements: Nayak has elucidated the pathophysiology and etiology of several liver disorders, particularly those common in India. His work has shed light on the evolution of pulmonary tuberculosis lesion and on the pathology of high- altitude sickness. His work on the Indian childhood cirrhosis has helped define precise criteria for its tissue diagnosis. He has also underscored the exclusion of hepatitis B virus in the cause of the disease and the secondary role of excess copper. He was among the first to describe new immunohistochemical techniques to identify hepatitis B virus antigens and the carcino-embryonal protein, alpha - feto protein, in tissues.

Positions: Professor of Pathology (1972-), Associate Professor of Pathology .(1966-72), Assistant Professor of Pathology (1962- 66), All India Institute of Medical Sciences, New Delhi; Assistant Professor of Pathology, Medical College, Cuttack (1957- 61).

Learned and Professional Societies: Fellow, National Academy of Medical Sciences (India); Member, Indian Association of Pathologists and Microbiologists

(IAPM), Asia-Pacific Association for the Study of the Liver, and Liver Study Group of India.

Awards and Honours: Khanolkar Prize (IAPM) (1977); Smt. Kunti Mehrotra Prize (IAPM) (1980); Basanti Devi Amir Chand Award (ICMR) (1980); Hari Om Ashram Award (Medical Council of India) (1980); P.V. Gharpure Oration Award (Haffkine Institute) (1980); A.K. Banerjee Award (Post-Graduate Institute of Medical Education and Research) (1980).

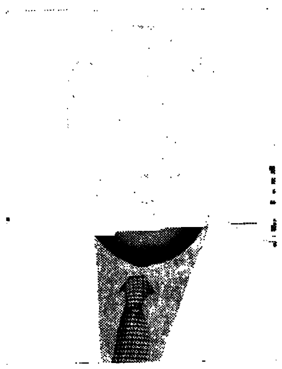
Author/Editor Facet: Contributed 10 chapters to reference books.

Policy-making Bodies: Member, WHO Expert Group on Classification and Nomenclature of Cirrhosis of the Liver (1978); Scientific Advisory Board of ICMR (1980-82); Scientific Panel on Animal Husbandry, ICAR (1980-82).

Address: Professor and Chairman, Department of Pathology, Faculty of Medicine, Kuwait University, PO Box 24923, Safat, 13110 Kuwait; Tel: (965) 5319476, (965) 4847814 Res: 92, Charak Sadan, Vikaspuri, New Delhi 110 018; Tel: (011) 5599325.

NAYAR, Krishnapillai Karunakaran

Elected 1972



Born 12 June 1920; Kottarakara, Kerala
Ph.D. (1947), University of Travancore

Specialization: Zoology

Research Achievements: Starting his research career as a taxonomist, Nayar made a survey of the gall insects of Travancore and made some important contributions to our knowledge about this group of insects. Subsequently, he made substantial contributions to endocrine mechanism in insects. He elucidated the endocrine mechanisms underlying reproduction, including oviposition, in *Iphita* and its metamorphosis. Also worked on comparative aspects of regeneration and carcinogenesis. Nayar laid emphasis on experimental work.

Positions: Professor and Head, Department of Zoology, University of Kerala, Trivandrum; Guest Research Worker, Rothamstead Experimental Station, UK (1953-54); Commonwealth Visting Professor, School of Biological Sciences, University of East Anglia, UK (1968-69).

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: UGC National Lecturer (1971).

Other Contributions: Established an association for advancement of entomology and initiated steps to found *Entomon.*

Died 26 June 1975.

NAYUDAMMA, Yelavarthy

Elected 1975

Born 10 September 1922; Andhra Pradesh
Ph.D. (1951), University of Lehigh, USA; D.Sc. (*h.c.*), Banaras, Andhra, Sri Venkateswara and Sambalpur universities

Specialization: Biochemistry, Leather Technology

Research Achievements: Nayudamma's field of specialization was leather science and technology. His work included studies on the physico-chemical properties of raw and tanned collagen; coordination complexes of chromium, aluminium and zirconium; combination tannages such as chrome-vegetable tanning; biogenesis and chemistry of vegetable tannings; mechanism of tanning, in particular protein-tanning interactions. He did commendable work in practical application of these methods in leather technology, particularly in the utilization of indigenous raw materials by the Indian leather industry.

Positions: Director, Central Leather Research Institute (CLRI), Madras; Director-General, Council of Scientific and Industrial Research, and Secretary to the Government of India, New Delhi; Vice-Chancellor, Jawaharlal Nehru University, New Delhi; Hony Professor, University of Madras; Distinguished Scientist, CLRI, Madras.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Indian Standards Institution, Institution of Chemists (India) (sometime President); Member, American Leather Chemists Association and International Union of Leather Trade Chemists, and Society of Leather Trade Chemists (UK); Academic Member, Indian Science Writers Association; President, COSTED; Member, INSA Council (1977-79).

Awards and Honours: Dr.K.G. Naik Gold Medal (M.S. University of Baroda) (1965)

Author/Editor Facet: Authored an ACS Monograph 'Education in Leather Technology'.

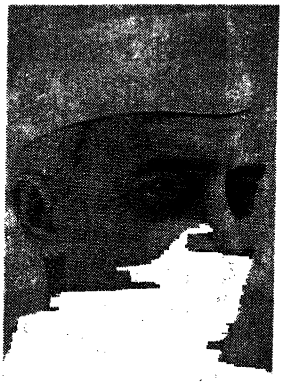
Policy-making Bodies: Nayudamma was Founder Member of Association for Science Cooperation in Asia. Represented India on Commonwealth Science Council. As consultant to UN, he contributed to the growth and development of leather industry in developing countries. As Governor of International Development Research Centre (Canada), he championed the cause of appropriate technology.

Other Contributions: Nayudamma's name has become synonymous with the new 'culture of science' he introduced in CSIR. He championed the cause of backward districts, whose uplift, he firmly believed, lay in the application of science and technology to bring about socio-economic development.

Died 22 June 1985.

NEHRU, Jawaharlal

Elected 1947



Born 14 November 1889
Tripos in Natural Sciences -- Botany, Chemistry, Geology, Trinity College, Cambridge 1910

Prime Minister of India (1950-64)

President, Indian Science Congress (1947), (Hony Fellow of several learned societies); Bharat Ratna.

As the chief architect of modern India, Pandit Jawaharlal Nehru symbolized the resurgence of India and her march towards progress. He had an abiding faith in science and technology as instruments of social and economic progress. Immediately after Independence, he embarked upon the mighty task of building the India of today through formulation and execution of a dynamic science policy ("Scientific Policy Resolution") for the country. He saw science as a great intellectual discipline which broadened human personality and led to objectivity and broader vision. It was this scientific temper he cherished and valued, and which he strove to inculcate in the people of the country.

If Science and Technology have a firm foundation in the country today, it is mainly due to his efforts. He included scientific research as a new portfolio in the Cabinet of the first National Government formed in August 1947. This portfolio assumed even greater importance by the Prime Minister himself assuming its charge. He was the President of the Council of Scientific & Industrial Research (CSIR) after its reorganization in 1948 and was largely responsible for the establishment of a chain of national laboratories and for expanding the activities of CSIR. He also held under his direct charge the Department of Atomic Energy, ever since its inception in 1954.

Pandit Nehru seldom missed an opportunity to be among scientists, whom he always held in great esteem. His visits to the annual sessions of the Indian Science Congress Association had assumed the form of an yearly pilgrimage.

On 19 April 1948, he laid the foundation stone of the building which now houses the Indian National Science Academy in New Delhi.

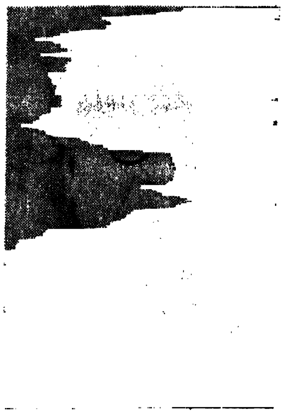
The Nehru era was the golden age of science and technology in India. His rich and wonderful legacy will continue to inspire the present and future generations of scientists.

INSA has instituted 'Jawaharlal Nehru Birth Centenary Medal' and 'Jawaharlal Nehru Birth Centenary Lecture Award' in his memory.

Died 27 May 1964.

NEOGI, Panchanan

Elected 1936



Born 4 October 1883; Howrah, West Bengal
Ph.D. (1918), University of Calcutta

Specialization: Chemistry, History of Chemistry

Research Achievements: Neogi's Ph.D. thesis is a definitive contribution to the history of chemistry in Ancient India, particularly in the metallurgy of iron and copper. He will also be remembered for his contribution to the stereochemistry of nitrogen, optical isomerism of coordinated inorganic compounds, and chemistry of elements.

Positions: Professor of Chemistry, Rajshahi College (1907-21), Bengal Engineering College (1921-25) and Presidency College (1925-42), Calcutta.

Awards and Honours: President, Chemistry Section, Indian Science Congress (1933); Foundation Member, Indian Chemical Society.

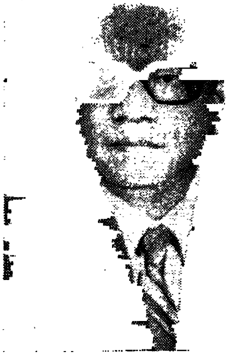
Author/Editor Facet: Authored two monographs --'Iron in Ancient India' and 'Copper in Ancient India'--both published as memoirs of the Indian Association for the Cultivation of Science in 1916 and 1918 respectively. And his other book 'Ayurveda and Modern Chemistry' was published in 1921.

Died 5 June 1950.

NIGAM, Hira Lal

Elected 1977

Born 1 October 1922; Deorajnagar, Madhya Pradesh
D.Phil. (1949), University of Allahabad; Ph.D. (1958), University of London, UK



Specialization: Inorganic Chemistry, Co-ordination Chemistry, Magnetochemistry, Electrochemistry, X-Ray Absorption Spectroscopy

Research Achievements: Nigam has made pioneering contribution to the application of X-ray absorption spectroscopy in the study of coordination compounds. His work on metal carbonyls led to stabilization of some less known valence states and newer coordination numbers. He has made an important contribution to spectral correlation of polarographic data on complex compounds.

Positions: Vice-chancellor, A.P.S. University of Rewa (1982- 88); Chairman, Environmental Planning & Coordination, Organic Rural Wing, Government of Madhya Pradesh (1984-88); Professor of Chemistry, University of Allahabad (1977-83).

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Indian Chemical Society (President, 1990-91) and Vijnyan Parishad; Indian Chemical Society (Council Member, 1980-); National Academy of Sciences (India) (Council Member, 1976-84 sometime President, Physical Sciences Section), Guest of Honour at Quinquineal Mendeleef Congress, Baku (USSR) (1981); Member, INSA Council (1979-83).

Awards and Honours: President, Chemistry Section, Indian Science Congress (1980).

Lectureships: Acharya P.C. Ray Memorial Lecture and Medal (1987) and Sir J.C.Ghosh Memorial Lecture (1989) (both Indian Chemical Society).

Author/Editor Facet: Hony editor *J. Indian Chem. Soc.* (1981- 89); Executive editor, National Academy Science Letters (1978-85); Editor, *Vijnyan* (1950-56); Author of 'Prakash Rasayan'.

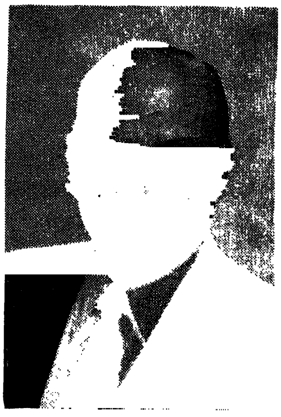
Policy-making Bodies: Presided over technical sessions at International Conference of Coordination Chemistry at Stockholm (1962), Toronto (1972), Dublin (1974), Prague (1978), Athens (1986) and Nanjing (1987).

Other Contributions: Worked for international cooperation in science (chemistry) and popularization of science in Hindi.

Address: B-332 B, Sector A, Sitapur Road Scheme, Lucknow 226 020; Tel: (0522) 72916.

NIJHAWAN, Bal Raj

Elected 1957



Born 22 September 1915; Lyallpur, Pakistan
Ph.D. (Metallurgy) (1941), University of Sheffield, UK

Specialization: Metallurgical Engineering Research and Development, Applied Sciences

Research Achievements: Nijhawan carried out internationally acclaimed research and development work on armour plate technology and armour failure and related defence R&D areas and on control of austenitic grain size of steel. Developed R&D and production technology for special alloys with the use of indigenously available metals including world-acclaimed nickel- free austenitic stainless steel based on Cr, Mn and N systems.

Positions: Senior UNIDO Consultant (currently), Senior Inter- regional Adviser to UNDP covering metallurgical industries and R&D centres throughout the world; Director, National Metallurgical Laboratory, Jamshedpur (till 1966).

Learned and Professional Societies: Fellow, American Society of Metals; Hony Member, Indian Institute of Metals; Vice- President, British Iron and Steel Institute; Hony Member, Japanese Iron and Steel Institute; Member d'Honneur de la Society Francaise de Mettalurgie (Paris); Hony Member, Institute of Indian Foundrymen; Fellow, Institute of Metallurgists (UK).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1964); Japanese Iron and Steel Institute's Gold Medal (1975); NML Gold Medal; International Award of Polish Government (1986); Award of Honour and Gold Medal (Czechoslovakia Government (1989); International Award of Yugoslavia Government (1980); Padma Shri (1958).

Author/Editor Facet: Published books on 'Austenitic Grain Size of Steel' and 'Production of Iron and Steel and High Quality Product Mix - Technological Innovations' (American Society of Metals) (1992), edited by B.R. Nijhawan.

Policy-making Bodies: Member of several United Nations boards on the development of metallurgical industries and numerous Indian bodies and committees.

Other Contributions: Leader in metallurgical engineering covering ferrous and non-ferrous metals and alloys; established, through financial assistance of UNIDO (UN), 25 internationally renowned "Centre of Metallurgical Technology" in 25 developing countries as also mineral and metallurgical R&D centres -Iron and Steel Technology Centres in developing countries.

Address: Senior UNIDO Consultant (United Nations), 2805 Raintree Court, Kokomo-IN, 46902, USA; Tel: 317-455- 1273; Fax: 317-452- 8790.

NITYA ANAND

Elected 1970

Born 1 January 1925; Lyallpur, Pakistan
Ph.D. (1948), University of Bombay; Ph.D. (1950), University of Cambridge, UK

Specialization: Medicinal Chemistry, Organic Synthesis, Pharmaceutical Technology

Research Achievements: Nitya Anand's research has led to the development of a number of biologically active compounds of use in fertility regulation, parasitic diseases, CNS and CVS disorders, and immunomodulation. Some of the drugs have reached the market-place after being registered as new drugs which include Centchroman, Centbucridine, Gugulipid and Centbutindole. He has contributed to: (i) concepts of drug design (especially the one based on molecules with restricted rotation); (ii) new methods of organic synthesis (the chemistry of lactam and amide acetals being explored in depth); (iii) topography of drug receptors (a five-subsite hypothesis for estrogen receptor being proposed); (iv) mode of action of drugs (specially to the action of streptomycin); and (v) developing new therapeutic modalities (such as the role of immunomodulation in prophylaxis and chemotherapy of parasitic infections).

Positions: INSA Senior Scientist (1985-88), Director (1974- 84), Central Drug Research Institute, Lucknow; also held several visiting professorships at universities.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India); Member, American Chemical Society, Indian Chemical Society, American Association for the Advancement of Science; Member, INSA Council (1974-76).

Awards and Honours: A.V. Mody Research Foundation Award (1971); Acharya P.C. Ray Memorial Medal (Indian Chemical Society) (1972); Dr. K.G. Nayak Gold Medal (M.S. University of Baroda) (1972); Acharya J.C. Ghosh Gold Medal (Indian Chemical Society) (1976); Dr. J.B. Chatterji Gold Medal (School of Tropical Medicine, Calcutta) (1978); Vishwakarma Medal (INSA) (1982); Schroff Memorial Award (Indian Hospital Pharmacy Association) (1981); Distinguished Alumnus (University Department of Chemical Technology, Bombay) (1985); Thai

Institute of Science & Technology Research Award; Nehru Award for Science (Madhya Pradesh Government); UGC National Professor (1974).

Lectureships: Kabbur Memorial Lecture (University of Bombay) (1969); Bisheshwar Nath Memorial Lecture (Indian Medical Association) (1974); B.V. Patel Memorial Lecture (1975); S.S. Sokhey Memorial Lecture (1977); Bawa Kartar Singh Memorial Lecture (Panjab University) (1979); Prof. T.R. Seshadri Memorial Lecture (University of Delhi) (1981); Prof. R.C. Shah Memorial Lecture (University of Bombay) (1983); Dr. Om Prakash Memorial Lecture (AIIMS) (1988); G.S. Sidhu Lecture (IICT, Hyderabad 1988); Zaheer Memorial Lecture (Indian Chem. Soc.) (1992).

Author/Editor Facet: Co-authored 'Art in Organic Synthesis'; co-edited 'Chemotherapy and Immunology in the Control of Malaria, Filariasis and Leishmaniasis'.

Policy-making Bodies: Chairman, Indian Pharmacopoeia Committee (1981-85, 1986-90, 1991-); Member, Scientific Advisory Committee to the Cabinet, Government of India (1981- 82); Member, Advisory Group for Research in Human Reproduction, WHO (1981-82); Chairman, Steering Committee for Chemotherapy of Malaria, WHO (1981-85); Member, Scientific & Technical Advisory Committee for Tropical Disease Research, WHO (1987-89); Member, International Review Group of DBT for Immunological Approaches to Fertility Control (1987-88); Consultant, UNIDO (1976); Associate Member, IUPAC Medicinal Chemistry Division.

Other Contributions: Established an active school of medicinal chemistry at CDRI, Lucknow.

INSA has instituted 'Dr Nitya Anand Endowment Lecture' in his honour.

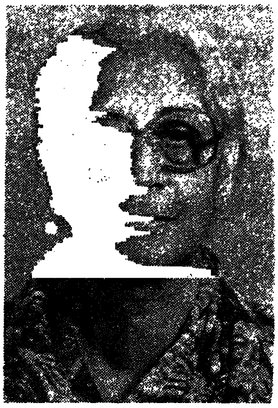
Address: Scientist Emeritus, Central Drug Research Institute, Lucknow 226 001; Tel: (0522) 72451; Telex: 0535-286; Fax: 91-522- 243405; Res: B-62, Nirala Nagar, Lucknow 226 007.

NITYANAND, Swarn *Elected 1993*

Born 11 April 1929
MBBS (1951), University of Delhi; M.D. (1960), University of Lucknow

Specialization: Medical Science: Experimental and Clinical Medicine

Research Achievements: Nityanand's most important contribution has been the development of experimental models for pulmonary hypertension and atherosclerosis, and in new lipid-lowering drugs. Using these and other experimen-



tal models, she and her coworkers have tested a number of traditional remedies and some synthetic compounds for lipid- lowering activity. As a result, a modern hypolipidaemic drug 'Gugulipid' was introduced into the market. She has also established the safety and efficacy of Centchroman, a new weekly-administered nonsteroidal contraceptive pill, through an in-depth study of the morphological features of the female genital organs in normal cases and Centchroman users and by drawing a baseline for these characters for the Indian population. Consequently Centchroman has been marketed and also approved for introduction in the National Family Planning Programme.

Positions: Consultant (1989-93), Deputy Director and Head, Clinical and Experimental Medicine (1986-89), Assistant Director (1978-86), all at Central Drug Research Institute, Lucknow.

Learned and Professional Societies: Life Member (Vice- President, 1983), Indian Pharmacological Society; Founder Member, Indian Society for Atherosclerosis Research, Indian Society for Toxicity (Executive Member, 1981) and Uttar Pradesh Academy of Science; Member, International Heart Research Society (Indian Section), Indian Medical Association and Indian Society of Parasitology.

Awards and Honours: Smt. Chandaben Mohanbhai Patel Industrial Research Award (Vividhlaxi Audyogik Samshodhan Vikas Kendra (VASVIK) (1988).

Author/Editor Facet: Served as member of editorial boards of: *Indian J. Exp. Biol.* and *Indian J. Med. Res.*

Other Contributions: She has paid much attention to the health problems of villagers.

Address: Department of Clinical & Experimental Medicine, Central Drug Research Institute, Lucknow 226 001; Tel: (0522) 232411-18 (Ext 4371); Telex: 0535-286; Fax: 91-522- 243405; Res: B-62 Nirala Nagar, Lucknow 226 020; Tel: (0522) 72451.

NORI, Madhav Vithal

Elected 1988

Born 14 December 1949; Baroda, Gujarat
Ph.D. (1981), University of Bombay

Specialization: Algebraic Geometry

Research Achievements: Nori demonstrated the existence of a nontrivial Griffiths group which is not detectable by the Intermediate Jacobian.

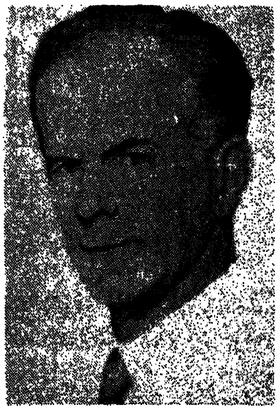
Positions: Visiting Professor, Tata Institute of Fundamental Research, Bombay (1993); Professor, Department of Mathematics, University of Chicago, USA; Member, Institute of Advanced Study, Princeton, USA.

Awards and Honours: INSA Young Scientists Award (1980).

Address: Department of Mathematics, University of Chicago, 5734 S. University Avenue, Chicago, Il 60637, USA.

NORMAND, Sir Charles William Blyth

Foundation Fellow



Born 10 September 1889; Edinburgh, UK
D.Sc. (1913), University of Edinburgh, UK

Specialization: Atmospheric Science, Meteorology

Research Achievements: Normand had specialized in upper air problems. His work provided upper air data which are of utmost importance to aviation and to a better understanding of the structure of the atmosphere. He also made special studies of particular weather phenomena like Nor'westers of Bengal, depressions, etc. by means of intensive soundings of the atmosphere. The Indian Meteorological Department developed a special radiosonde suitable for use in India. Normand was the first to introduce the concept of wet-bulb potential temperature, which is practically an invariant in adiabatic processes in the atmosphere. He introduced another invariant quantity, 'equivalent potential temperature', which is a single- valued function of wet- bulb potential temperature. With the passage of time and the growing volume of upper air data these two quantities have proved most useful in the analysis of weather. Normand will be remembered for a theorem after his name, which finds a prominent place in reference books on atmospheric thermodynamics.

Positions: Director-General of Observatories, Meteorological Office, Pune.

Learned and Professional Societies: Vice-President, International Aerological Commission for Region D (comprising India, East Indies and the Far East); Member, Council (1935- 40, 1944), Vice- President (1941-42), INSA.

Awards and Honours: CIE (1938); Knighted (1945), Symons Medal, Royal Meteorological Society (London) (1944); President (twice), Mathematics and Physics Section, Indian Science Congress (1931, 1938).

Other Contributions: Normand was the Member of the Academy Committee representing the All India Government Departments formed by the Indian Science Congress Association for drafting the constitution of INSA.

Died 25 October 1982.

NOTANI, Nihal Kishinchand

Elected 1976

Born 21 January 1930; Hyderabad, Pakistan
Ph.D. (1957), Purdue University, USA

Specialization: Genetics, Radiation Biology, Environmental Mutagenesis

Research Achievements: Notani has shown the mechanism of transformation in bacterium *Haemophilus influenzae* to be through integration of single-stranded segments of input DNA into the homologous regions of resident chromosome; he has cloned two DNA repair genes; isolated and characterized a large, linear plasmid from *Streptomyces rhimosus*; analyzed a genetically unstable region in *Streptomyces lividans*; proposed an excision mechanism for maize transposable elements; transferred 3 DNA sequences including *bar* gene (resistance to herbicide Bialaphos) to tobacco; obtained true-breeding transgenic (herbicide-resistant) plants.

Positions: INSA Senior Scientist (1990-93); Director, Biomedical Group, Bhabha Atomic Research Centre, Bombay; FAO/IAEA Fellow, University of Cornell and University of Wisconsin; National Science Foundation (USA); Senior Foreign Scientist Fellow; Visiting Professor, University of Tennessee, USA.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Maharashtra Academy of Sciences, and National Academy of Agricultural Sciences (India); Elected Member, Human Genome Organization; Member, INSA Council (1987-89).

Awards and Honours: B.C. Guha Memorial Lecture Award (INSA) (1990).

Lectureships: Manjrekar Memorial Lecture; Dr S.R. Vyas Memorial Lecture (AMI, Annamalai) (1990); Professor G.J. Kane Lecture (University of Bombay) (1991); T.K. Gajjar Lectures (Gujarat University, Ahmedabad) (1991).

Author/Editor Facet: Edited *Mutation Res.* (several years).

Policy-making Bodies: Member, Council of International Cell Research Organisation (Unesco), Paris (for 9 years); Vice- President, International Association of Environmental Mutagen Societies (for 4 years); India's Representative on UN Scientific Committee on Effects of Atomic Radiation (3 years); Member, International Commission for Protection against Environmental Mutagens and Carcinogens (6 years).

Address: Emeritus Scientist, Biomedical Group, Bhabha Atomic Research Centre, Trombay, Bombay 400 085; Tel: (022) 5510323; Telex: 011-71017 BARC IN; Fax: 91-22-5560750; Res: 43, Juhu Ajanta Cooperative Housing Society, Gulmohar Road, JVPD Scheme, Bombay 400 049; Tel: (022) 6204185.

OLVER, (Col.) Sir Arthur

Foundation Fellow

Born 1875; Trescowe, England
FRCVS (1908), Royal College of Veterinary Surgeons, London, UK

Specialization: Veterinary Science and Animal Husbandry

Research Achievements: Olver contributed to veterinary services, particularly in his capacity as an Expert Adviser in Animal Husbandry to the Government of India.

Positions: Assistant Director-General, Veterinary Services (1908); Deputy Director, Veterinary Services, British Remount Commission, Canada and America (1917), India (1928-30); Expert Adviser in Animal Husbandry, Government of India (1930-38); Principal, Royal (Dick) Veterinary College, Edinburgh (1938-45).

Learned and Professional Societies: Fellow, Royal Society of Edinburgh; Member, INSA Council (1940-43).

Awards and Honours: Queen's Medal; CB (1919); Knighted (1937); President, All India Veterinary Conference (1930) and Indian Science Congress (1937-38).

Author/Editor Facet: Authored 'A Brief Survey of Some of the Important Breeds of Cattle in India' (ICAR, 1938).

Policy-making Bodies: Member, Royal Commission of Veterinary Services.

Other Contributions: Sir Arthur put the animal husbandry and veterinary services in India on a firm footing through various schemes he had formulated.

Died 15 August 1961.

PADAYATTY, Joseph D.

Elected 1987

Born 10 July 1928; Karukutty, Kerala
Ph.D. (1965), St Louis University, USA

Specialization: Molecular Biology, Recombinant DNA

Research Achievements: Padayatty's research achievements relate to the following areas-*Rice*: Bidirectional transcription of histone genes. Negative regulation of transcription of tRNA$^{\mathrm{Gly}}$ GCC. Multiple initiation sites for transcription of rRNAs; *Colitis bacteriophage*: Amino acid sequences of lytic enzymes and a structural protein from nucleotides sequences; *Foot and mouth disease virus (FMDV)*: Fused protein produced by recombitant DNA conferred protection to cattle against a heavy dose of FMDV.

Positions: Professor, Indian Institute of Science, Bangalore; ASTRA Professor.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Author/Editor Facet: Member, editorial board of *Indian J. Biochem. Biophys.*

Address: P.O. Karukutty, Dist. Ernakulam, Kerala 683576; Tel: (04856) 52107.

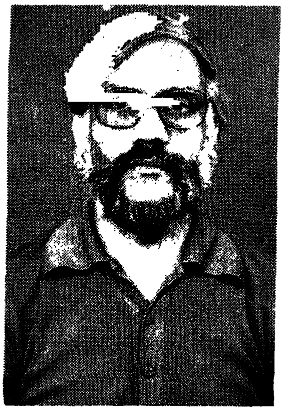
PADMANABAN, Govindaranjan

Elected 1985

Born 20 March 1938; Cuddapah, Andhra Pradesh
Ph.D. (1966), Indian Institute of Science (IISc), Bangalore

Specialization: Molecular Biology

Research Achievements: Padmanaban has established that haeme is a multifunctional regulator of cellular function. Elucidated the features of transcriptional regulation of Cyp II B1/B2 gene. Identified a new chemotherapeutic target in the malarial parasite *Plasmodium falciparum*. Established the role cytochrome P-450 in drug resistance in *P. falciparum*. Developed a DNA diagnostic probe to detect the parasite.



Positions: Deputy Director (1993-), Professor (1980-), Associate Professor (1975-80), Assistant Professor (1969-70), IISc, Bangalore; INSA-C.V. Raman Research Professor (1991-); Visiting Scientist/Professor, University of Chicago, USA (1973-86).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences(India); Member, Society of Biological Chemists (India); Member, INSA Council (1991-92).

Awards and Honours: Professor P.S. Sarma Memorial Award (1979); Shanti Swarup Bhatnagar Prize (1983); Om Prakash Bhasin Award (1985); Pitamber Pant Fellow (1987); Hony Professor, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore (1990); Jawaharlal Nehru Birth Centenary Visiting Fellowship (INSA) (1991); Padma Shri (1990).

Author/Editor Facet: Editor, *J. Biosci.* (1984-91); member of editorial board of *Curr. Sci.*; edited 3 books on Molecular Biology and Genetic Engineering.

Policy-making Bodies: Member, Scientific Working Group, Radiotherapy of Malaria, WHO (1988); Member, UGC (1986-89); Member, Scientific Advisory Committees, DBT and DST; Chairman, Research Council, Centre for Cellular and Molecular Biology, Hyderabad.

Other Contributions: Coordinated efforts to application oriented research in biotechnology in the country. Argued for improvement of research infrastructure in the country at several levels.

Address: Professor, Department of Biochemistry, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2540); Telex: 0845-8349; Fax: 080-341683; E-mail: geepee@vigyan.ernet.iisc.in; Res: No. 7, 8th Main Road, V K Extension, Bangalore 560 003; Tel: (080) 361549.

PAI, Mangalore Anantha

Elected 1980

Born 5 October 1931; Mangalore,Karnataka
Ph.D. (1961), University of California, Berkeley,USA

Specialization: Power System Stability, Control and Computation

Research Achievements: Pai has been a leading researcher in power system stability using energy function methods. He and his coworkers have developed suitable Lyapunov functions, which have helped make this technique suitable for on- line applications. In computational methods, they have investigated analysis by decomposition and parallel processing techniques. In voltage collapse area, they have made fundamental contributions by inclusion of system dynamics.

Positions: Professor, University of Illinois, Urbana, USA (1981-); Dean, R & D, (1976-78), Assistant Professor, Associate Professor and Full Professor (1963-1981), Indian Institute of Technology, Kanpur.

Learned and Professional Societies: Fellow, Institution of Engineers (India), Indian Academy of Sciences, and Institute of Electrical and Electronics Engineers, USA.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1974); FICCI Award (1978).

Author/Editor Facet: Authored/edited four books: 'Electric Circuits and Machines' (East-West Press 1974), 'Computer Techniques in Power Systems' (Tata McGraw-Hill, 1979), 'Power System Stability' (North-Holland, 1981), and 'Energy Function Analysis' (Kluwer, 1989).

Policy-making Bodies: Member, Applications Committee, International Federation of Automatic Control.

Other Contributions: Developed in-house computer expertise at U.P. State Electricity Board in 1970's.

Address: Professor, University of Illinois, Urbana, IL 61801, USA; Tel: (217) 3336790 (Off), (217) 3440977 (Res); Fax; (217) 3337427; E-mail: pai@uipesl.ece.uiuc.edu.

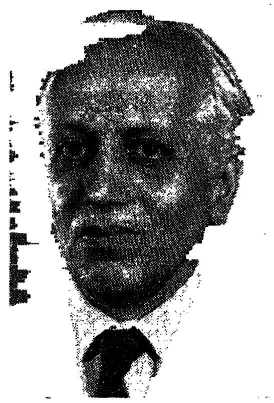
PAINTAL, Autar Singh

Elected 1972

Born 24 September 1925; Mogok, Myanmar
D.Sc. (1960), University of Edinburgh, UK; D.Sc. *(h.c.)* from four universities

Specialization: Physiology (Neuro and Cardiorespiratory)

Research Achievements: Paintal began his research career by introducing a new index for evaluating galvanic skin responses in 1951, new techniques for recording impulses from single active fibres from nerves and proving their conduction velocities and a method for locating visceral receptors. He discovered (i) type B atrial receptors, (ii) gastric stretch receptors responsible for the immediate satiation of hunger and thirst, (iii) ventricular pressure receptors, (iv) mucosal mechanoreceptors of the intestines and (v) pressure-pain receptors of muscles. He is best known for the discovery of the J receptors and for showing that they produce tachypnoea and breathlessness, that they are interstitial volume receptors and that they produce inhibition of somatic muscles. With A.Anand he later showed that they are stimulated by increase in blood flow, and finally, that they produced sensations in the throat leading to dry cough. With R. L. Riley he showed that there were no chemoreceptors in the pulmonary circulation and that aortic chemoreceptors were not stimulated by CO_2. Recently he discovered the principle relating to the relative dilution of multiple solutes in flowing fluids. Using this principle he, with Anand, introduced a new method for measuring *in vivo* the blood concentration of injected drugs.



Positions: Programme Director, Centre for Visceral Mechanisms, V.P. Chest Institute, Delhi (1981-); Director General, ICMR (1986-91) ; Director, V. P. Chest Institute (1964-90) and Principal, University College of Medical Sciences, University of Delhi (1971-72); Professor of Physiology, All India Institute of Medical Sciences, New Delhi (1958-64).

Learned and Professional Societies: Fellow, Royal Society of London, National Academy of Medical Sciences,India (NAMS), Indian Academy of Sciences, Royal College of Chest Physicians, and Asiatic Society; Hony Fellow, Royal Society of Edinburgh; Hony Member, Physiological Society, (UK), American Physiological Society; Foreign Member, Soviet (Russian) Academy of Science;Founder Member (first President), Society for Scientific Values; President, INSA (1987-88).

Awards and Honours: Shakuntala Devi Amir Chand Prize (ICMR) (1956); Basanti Devi Amir Chand Prize (ICMR) (1957); Dr. B.C.Roy National Award (1973) and Silver Jubilee Research Award (both of Medical Council of India, MCI) (1979); Barclay Medal (Asiatic Society) (1982); Rameshwardas Birla National Award (1982); First Jawaharlal Nehru Award in Science (Madhya Pradesh Government) (1983); Acharya J.C. Bose Medal (1985); Silver Jubilee Award (AIIMS) (1986); Padma Vibhushan (1986).

Lectureships: Basanti Devi Amir Chand Prize Oration (1968); Indian College of Allergy and Applied Immunology Oration (1969); Sarabhai Oration (Association of Physicians of India) (1970); Sri Ram Oration (NAMS) (1973); Dr. B.C. Roy Oration (1974); Chandy Oration (Neurological Society of India) (1978); Silver

Jubilee Research Award Oration (MCI) (1979); Warner Oration (National College of Chest Physicians) (1981); Sharpey-Schaffer Memorial Lecture, Edinburgh (1981); Nayudamma Science Foundation Lecture (1982); NAMS Oration (1982); Dr. Raju Oration (Pharmacological Society of India) (1982); Ranbaxy Oration (1985); Brig. Mazumdar Memorial Lecture (1987); J.C. Bose Memorial Lecture (1988); V. Ramakrishna Memorial Lecture (1989); K.N. Seneviratne Memorial Lecture,Colombo (1990).

Author/Editor Facet: Chief Editor, *Indian J. Chest Dis.*; editor, *Indian J. Physiol. Allied Sci.* and *J. Auton. Ner. Sys.*; associate editor, *News Physiol. Sci.* (IUPS and APS); edited 'Morphology and Mechanism of Chemoreceptors' and 'Respiratory Adaptations, Capillary Exchange and Reflex Mechanisms'.

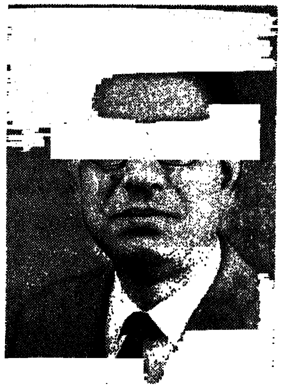
Policy-making Bodies: Member, IUPS Commission on Somato- Sensory Physiology.

Other Contributions: Made a major contribution to the creation of awareness of AIDS in India controlling its spread; made fruitful efforts to encourage intellectual independence; contributed towards the development of young women, their uplift and related matters for controlling the population.

Address: Programme Director, Centre for Visceral Mechanisms, Vallabhbhai Patel Chest Institute, Delhi University, P.O. Box 2101, Delhi 110 007; Tel: (011) 7257749, 7257856.

PAKRASHI, Satyesh Chandra

Elected 1984



Born 1 February 1930; Sthal, Bangladesh
Ph.D. (1954), University of Calcutta

Specialization: Natural Products Chemistry

Research Achievements: Pakrashi has done extensive work on the chemistry of natural products in general and minor alkaloids in particular. He is one of the pioneers in the country in applying modern physical methods to determine the structure of natural products. Apart form his contributions on the indole alkaloids of *Rauvolfia* and other Apocynaceous species, he is credited with the discovery of the only other source of ipecac alkaloids, a biogenetically unique protoberberine (Bharatamine), new classes of natural products (e.g. pyridobenzoquinolizidines, steroidal alkaloids with pyridine ring, spirofuropyranperhydrophenanthrene), a reagent (triphenylphosphine-tetrahalogenomethane) for acyl migration from N→O, abnormal metal hydride reduction and chromic acid oxidation of 4-quinazolinones, abnormal Reformatsky reaction and the mechanisms thereof. He also synthesized, among others a number of indole and isoquinoline alkaloids of structural and therapeutic interest.

Positions: CSIR Distinguished Fellow (1990-), Director, (1985- 90), Indian Institute of Chemical Biology (IICB), Calcutta; Director, Regional Research Laboratory, Bhubaneswar (1989-90).

Learned and Professional Societies: Life Member, Indian Chemical Society (twice Executive Council Member); and Indian Association for the Cultivation of Science (Vice-President and Council Member); Foundation Fellow, West Bengal Academy of Science and Technology (charter Vice-President, 1986-93).

Awards and Honours: Basudev Memorial Award (Indian Chemical Society) (1967); UGC National Lecturer (1985); President elect, Indian Science Congress (1994-95).

Lectureships: Prof. N.V. Subba Rao Memorial Lecture (Osmania University) (1984-85); Professor K. Venkataraman Memorial Lecture (UDCT, Bombay) (1988).

Author/Editor Facet: Served as assistant editor, *Ann. Biochem. Exp. Med.* (1961-63); member, editorial committee, *Med. Arom. Plants Abstr.*; co-edited a 6 volume series of monographs entitled 'The Treatise on Indian Medicinal Plants' (CSIR); contributed a chapter to 'Fortschritte der Chemie Organischer Naturstoffe' (Springer-Verlag, 1966).

Policy-making Bodies: Serving on academic/programme advisory committees/research councils of AIIMS, DST, CSIR and other bodies.

Other Contributions: Pakrashi is engaged in popularizing science and developing scientific awareness in rural areas through the Science Association of Bengal.

Address: CSIR Distinguished Fellow, Indian Institute of Chemical Biology, 4 Raja S.C. Mullick Road, Jadavpur, Calcutta 700 032; Tel: (033) 4735386; Res: Meghamallar, Flat No.8F-2, 18/3, Gariahat Road, Calcutta 700 019; Tel: (033) 4404687.

PAL, Benjamin Peary *Elected 1946*

Born 26 May 1906; Mukandpur, Punjab
Ph.D. (1932), University of Cambridge,UK; D.Sc.*(h.c.)* from Panjab, Uttar Pradesh, Orissa and Haryana Agricultural Universities, BHU and Sardar Patel University

Specialization: Genetics and Plant Breeding

Research Achievements: Pal was well known for his contributions to crop improvement, particularly the breeding of superior disease-resistant wheats. His 15-year-term as Director saw further enhancement of the role and status of the Indian Agricultural Research Institute. As the first Director-General of the reorganised ICAR, he was largely responsible for the first phase of India's Green Revolution. He also contributed to planning for environmental conservation.

Positions: Director, Indian Agricultural Research Institute (IARI), New Delhi; First Director-General, Indian Council of Agricultural Research; and Chairman, National Committee on Environmental Planning and Coordination.

Learned and Professional Societies: Fellow, Royal Society of London; Hony Fellow, Linnaean Society (London); Foreign Member, Lenin All Union Academy of Agricultural Sciences,and French Academy of Agriculture; Hony Member, Japan Academy, Genetics Society of Japan; President (sometime), Indian Society of Genetics and Plant Breeding, Indian Botanical Society, Horticultural Society of India, and Society for the Advancement of Breeding Researches in Asia and Oceania; President, INSA (1975-76),

Awards and Honours: Rafi Ahmed Kidwai Memorial Prize (1957); Birbal Sahni Medal (Indian Botanical Society) (1962); Srinivasa Ramanujan Medal (INSA) (1964); Grant Medal (Agri- Horticultural Society of India) (1970); Barclay Medal (Asiatic Society) (1971); Aryabhatta Medal (INSA) (1980); G.P. Chatterjee Memorial Award (Indian Science Congress Association) (1982); Sir William Jones Medal (Asiatic Society) (1982); President, Indian Science Congress; Sanjay Gandhi Memorial Award (1982); Padma Shri (1959); Padma Bhushan (1968); Padma Vibhushan (1987).

Author/Editor Facet: Pal was a prolific writer, popular as well as scholarly. 'The Rose in India', 'Beautiful Climbers of India', 'Flowering Shrubs of India', 'Bougainvilleas' and 'Environmental Conservation and Development' are among his well-known books. Also authored many monographs, one of them on wheat. Served INSA as editor (1966).

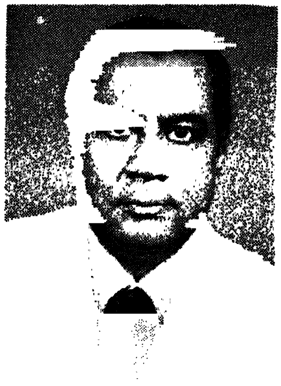
Policy-making Bodies: Served as a trustee of International Rice Research Institute, Philippines, during its formative years.

Other Contributions: Pal was the architect of All India Coordinated Research Projects on crops, animals and fisheries.

Died 14 September 1989.

PAL, Manoj Kumar

Elected 1990



Born 26 October 1932; West Bengal
Ph.D. (1958), University of Calcutta

Specialization: Nuclear Theory

Research Achievements: Pal has done extensive research on various aspects of nuclear theory.

Positions: Professor and Director, Saha Institute of Nuclear Physics, Calcutta (Retd).

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: UGC National Lecturer (1974-75).

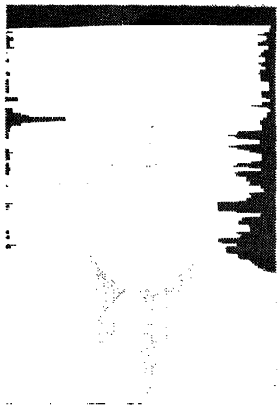
Author/Editor Facet: Authored 'Theory of Nuclear Structure' (Affiliated East-West Press).

Policy-making Bodies: Served as member of IUPAP National Committee.

Address: 41, Elgin Road, Flat-1B, Calcutta 700 028;Tel: (033) 4756829.

PAL, Rudrendra Kumar

Elected 1956



Born 25 October 1902; Sylhet, Bangladesh
D.Sc. (1931), M.R.C.P. (1931), University of Edinburgh, UK

Specialization: Physiology and Nutrition

Research Achievements: Pal's significant research contributions relate to: (i) effects of vitamins on thyroid and suprarenals; (ii) description of hitherto unknown structure of thyroglossal duct; (iii) vagotropic action of insulin on heart; (iv) cardiotonic action of insulin with transfusion of glucose solution, and (v) synthesis of two new oral hypoglycaemic drugs.

Positions: Vice-Principal and Professor of Physiology, R.G. Kar Medical College, Calcutta.

Learned and Professional Societies: Fellow, Royal Society of Edinburgh, Asiatic Society and Royal College of Physicians (Edinburgh); President, Asiatic Society (1983).

Awards and Honours: Nilmony Brahmachari Gold Medal (University of Calcutta) (1935); N.D. Agarwal Prize (University of Delhi) (1951, 1965); Member, INSA Council (1964-66).

Author/Editor Facet: Pal wrote two books in English: 'A Handbook of Modern Physiology' (Oxford & IBH, 1971) and 'Biology of Senescence: Problems and Perspectives' (Asiatic Society, 1972), and several others in Bengali.

Died 12 Feburary 1991.

PALIT, Santi Ranjan

Elected 1953

Born 24 March 1912; Calcutta, West Bengal
D.Sc. (1942), University of Calcutta

Specialization: Physical Chemistry

Research Achievements: Palit's researches spanned: polymerization kinetics, high polymers, surface-active agents, solubilization, cosolvency, polarization and dipole moments, non-aqueous titration and correlation of physical properties. He also studied the physical chemistry of lacquers, varnishes and non-aqueous solutions of soaps and resins. He made the important discovery that soap dissolves well in a mixture of glycol and hydrocarbon dissolving solvent though it is almost insoluble in either.

Positions: Lecturer in Chemistry (1936-38), Vidyasagar College, Calcutta; Research Chemist (1938-44), Indian Lac Research Institute, Namkum; Professor and Head (1947), Department of Physical Chemistry, Indian Association for the Cultivation of Science, Calcutta.

Learned Socieities: Fellow, Royal Institute of Chemistry (London); Vice-President, Indian Chemical Society (1973-74).

Awards and Honours: President, Chemistry Section, Indian Science Congress (1958).

Policy-making Bodies: Member, International Commission on Macromolecules, International Union of Pure and Applied Chemistry.

The Indian Association for the Cultivation of Science has instituted a biannual award in physical/ polymer chemistry in his memory.

Died 13 September 1981.

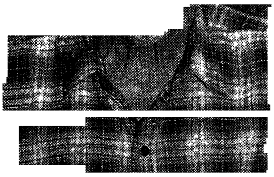
PANDE, Irish Chandra

Elected 1976

Born 14 January 1914; Naini Tal, Uttar Pradesh
Ph.D. (1954), University of London, UK

Specialization: Himalayan Geology

Research Achievements: Pande has put forward the hypothesis of migmatization of Himalayan metapellites, the occurrence of polymetamorphism in the Almora gneisses during the Tertiary period, the hypothesis of polygeosynclinal origin of the Himalayan Orogen, and the shifting of sedimentary faulted basins of the Himalaya as a sequel to migrating polarity and phased activation of deep-seated Himalayan faults (mantle faults).



Positions: Head and Director, Centre of Advanced Studies in Geology, Panjab University, Chandigarh (1966-76); Visiting Professor, Peoples Friendship University (former USSR) and Vikram University, Ujjain (1978).

Learned and Professional Societies: Fellow, Geological Society (London), American Association for the Advancement of Science; Member, Geochemical Society (India) and Indian Geological Association; President, Indian Geologists Association.

Awards and Honours: Scroll of Honour (Wadia Institute of Himalayan Geology) (1991); Chairman, Geology Section, International Geological Congress, Prague (1968); President, Geology & Geography Section, Indian Science Congress (1974).

Author/Editor Facet: Published two books: 'Tectonic and Metamorphic Investigations of Kumaon-Garhwal Himachal Lesser Himalaya', and 'Himalayan Tectogenesis, vis-a-vis Metamorphic Episodes'.

Policy-making Bodies: Chairman, Indian National Commision for IUGG; Indian Representative to IAAS (USA); Member, Governing Body, Wadia Institute of Himalayan Geology.

Address: Principal Investigator, DST Project, Wadia Institute of Himalayan Geology, Dehra Dun; Geological Consultant, 16 E.C. Road, Dehra Dun 248 001.

PANDE, Shiv Kanth

Elected 1959

Born 14 February 1899; Aihar, Uttar Pradesh
D.Sc. (1936), University of Lucknow

Specialization: Plant Morphology and Cytology

Research Acheivements: Pande made significant contributions to bryology. On *Riccia*, he initiated, for the first time, cultural and cytological investigation, mainly on the sporeling pattern. In *Notothylas*, he provided conclusive evidence on the then highly controversial origin of archesporium in the genus. Two well-known Indian species were found to be the present sources of origin for this tissue, i.e., from inner amphithecium in *N. indica* and from endothecium in *N. Levieri*. He built a rich collection of plants and herbs during his travels from the Himalayas to Sri Lanka.

Positions: Professor and Head, Department of Botany, University of Lucknow (1957); Research Scientist, National Botanical Research Institute (1958), Lucknow; Professor and Head, University of Saugor, Sagar.

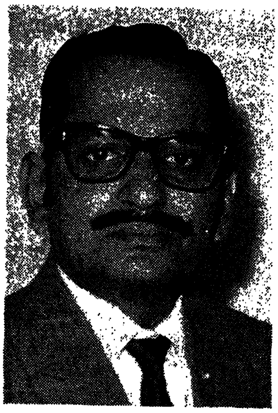
Learned Socieites: President, Indian Botanical Society (1958).

Awards and Honours: President, Botany Section, Indian Science Congress (1959).

Died 25 November 1960.

PANDEYA, Satish Chandra

Elected 1981



Born 1 January 1929; Kanpur, Uttar Pradesh
Ph.D. (1953), Saugor University; P.E.A. (1955), University of Perugia, Italy; D.Sc. (1992), Agra University

Specialization: Ecology, Enviornmental Science

Research Achievements: Pandeya's researches have elucidated that: the process of desertification is the sum total result of the vicious cycle operating between organic matter productivity of the land and its over-use and the stressed climatic conditions accentuating the process along time scale; impact of human activities on organic matter production in seminatural grazing lands in western India have been quantified. It is an inverse relation. Total Net Primary Production as also the ecological efficiency is highly significant trapezoid function of water status with optimum values between 500 and 1,000 mm (regime of C_4- plants). Just given mean monthly temperature and monthly rainfall, it is possible to predict potential net primary productivity (NPP). Pattern of NPP is well understood now in System Context. He discovered 25 ecotypes of fodder grass *Cenchrus ciliaris* and 9 of *C.setigerus* in western India. The ecotypes are climato-edaphic ones.

Positions: UGC Emeritus Fellow, Raja Balwant Singh College, Agra (1990-92); Professor and Founder Head, Department of Special Assistance in Bioscience, Saurashtra University, Rajkot (1969- 89); Visiting Professor, Dayalbagh Educational Institute, Dayalbagh, Agra (1989-90) and Jiwaji University, Gwalior (1988- 89).

Learned and Professional Societies: Fellow, Indian Botanical Society, National Academy of Sciences (India), Linnaean Society of London, and International Society for Tropical Ecology, International Rangeland Society, and Gujarat Science Academy.

Awards and Honours: UGC National Lecturer (1978-79; 1986-87); Pitamber Pant National Environmental Award Fellow (1988-91); Birbal Sahni Medal (Indian Botanical Society) (1990).

Author/Editor Facet: Authored 'Research Methods in Plant Ecology' (Asia Pub. House, 1968), 'Ecology of *Cenchrus* Grass complex: Environmental Conditions and Population Differences in Western India' (Kluwer Academic Pub., 1993); Chief Editor, *Trop. Ecol* (1962-65), 'Primary Productivity' (Int.. Workshop on Grassland Biome, USA).

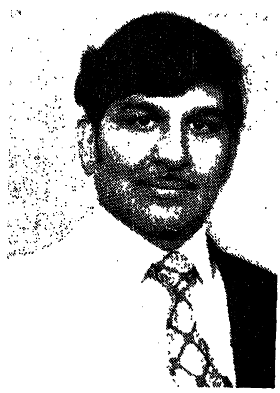
Policy-making Bodies: Consultant Global Environmental Monitoring System, UNEP and FAO, Rome (1976); Member, National Committee on Environmental Planning and Coordination Research Committee, and Man and the Biosphere Research Committee, DST; Gujarat State Council on Ecology; UGC Expert Panel on Biology (1974-76), Environmental Science (1982-); also member of several committees of International Union for the Conservation of Nature and Natural Resources and Unesco.

Address: UGC Emeritus Professor, Raja Balwant Singh College, Agra 282 002; Res: 2/125, New Karya Veer Nagar, Dayalbagh, Agra 282 005.

PANDIAN, Thavamani Jegajothivel *Elected 1987*

Born 15 June 1939; Palamedu, Tamil Nadu
Ph.D. (1966), University of Madras; Dr. rer. nat. (1968), Kiel, Germany

Specialization: Energetics, Genetics, Aquaculture



Research Achievements: Pandian undertakes long-term studies on food intake *(C)* and growth *(P)* on selected fishes, frogs, prawns and insects. He has made pioneering contributions to bioenergetics. Developed models to predict *C, P* and/or digestive efficiency of these animals from easily and quickly measurable indices. Currently interested in fish genetics, he has produced several new strains.

Positions: Head and Coordinator (1993), Professor (1978-), Reader (1971-78), School of Biological Sciences, Madurai Kamaraj University, Madurai; DBT Overseas Senior Fellowship (1988); Visiting Professor, University of South California, USA (1980- 81); Lecturer in Zoology, Bangalore University, Bangalore (1968- 71).

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Indian Academy of Sciences, National Academy of Agricultural Sciences (India), and Tamil Nadu Academy of Sciences; Member, INSA Council (1990).

Awards and Honours: Hooker Award (1978); UGC National Lecturer (1985-86); Shanti Swarup Bhatnagar Prize (1984); UGC National Fellow (1989-91); Naga Award (International Council of Living Aquatic Resource Management (ICLARM), Manila) (1991).

Author/Editor Facet: Associate editor, *Curr. Sci.* (1991-); member of editorial boards of : *J. Sci. Industr. Res.* (1987- 91), *J. Exp. Mar. Biol. Ecol.* and *J. Asian Fish. Sci.* (1986-); editorial adviser: 'Marine Ecology Progress Series' (Inter Research Publishers, Hamburg); joint editor of multivolume series on 'Animal Energetics' (Academic Press) and another series on 'Aquatic Animal Genetics' (Springer- Verlag); Contributed chapters to 6 volumes which include 'Marine Biology' (Wiley Inter-science), 'Fish Energetics : New Perspectives' (Croom Helm), 'Reproductive Biology of Invertebrates' (John Wiley); Editor of Publication, INSA (1991- 94)

Policy-making Bodies: Member, Project Review Committee/ Governing Council, Asian Fisheries Society; Consultative committee, ICLARM, Manila (1992-); and of several research advisory councils/academic councils of universities.

Other Contributions: Pandian is largely instrumental in the founding and growth of the Asian Fisheries Society. As an educationist he has contributed to the planning of the Alagappa University and development of Madurai Kamaraj University. Has also contributed to fish farming, as consultant.

Address: Professor, School of Biological Sciences, Madurai Kamaraj University, Madurai 625 021; Tel: (0452) 85212; 85230; Telex: 445-308 MKU-IN; Fax: 91-452-85204, 91-452- 45056; Res: 9, Old Nathan Road, Madurai 625 014; Tel: (0452) 42139.

PANDIT, Chintaman Govind

Elected 1939

Born 25 July 1895; Pune, Maharashtra
Ph.D. (1922), University of London, UK

Specialization: Communicable Diseases and Virology

Research Achievements: Pandit contributed to our knowledge of the epidemiology of the plague in South India. He also carried out epidemiological studies on cholera and filariasis and demonstrated the protective influence of vitamin C in experimental fluorosis. He was, in fact, the first to draw attention to the existence of widespread skeletal fluorosis in the country. Attempted transmission of leprosy infection to monkeys.

Postions: Director, King Institute of Preventive Medicine, Madras (1938-48); Director-General, Indian Council of Medical Research (1948-64); CSIR Emeritus Scientist.

Learned and Professional Societies: Foundation Fellow, National Academy of Medical Sciences (India).

Awards and Honours: President, Medical and Veterinary Sciences Section, Indian Science Congress (1991); OBE (1956); Padma Shri (1956), Padma Bhushan (1964).

Died 9 July 1991.

PANDYA, Anant Hargovind

Elected 1949

Born 11 July 1909; Bhavnagar, Gujarat
Sc.D., Massachusetts Institute of Technology,USA

Specialization: Civil Engineering, Structural Engineering

Research Achievements: Pandya successfully executed several complicated constructions like the tunnel at the Bhore Ghat for the Central Railways, tunnel for laying the pipelines for the Vaitarna-cum-Tansa Scheme for the Bombay Municipality and the construction of Konar Dam and other projects of DVC and the development of the parts of Saurashtra, and Kandla project (Kutch). His supervision

Research Institute; Fishery Development Adviser, Government of India; Director, International Indian Ocean Expedition and National Institute of Oceanography, Panaji; Member, National Commission on Agriculture; Vice-Chancellor, University of Cochin.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Royal Society of Arts (London), National Academy of Sciences (India), and Indian Geophysical Union; Member, Council (1961-62, 1969-71), Secretary (1965-68), INSA.

Awards and Honours: Galathea Medal of Denmark (1953); Sir Dorabji Tata Medal (Zoological Society of India) (1961-63); Chandrakala Hora Medal (INSA) (1971); Padma Shri (1973).

Authors/Editor Facet: Served on the editorial boards of many journals, including *J. Zool. Soc. India, Indian J. Exp. Biol., Indian J. Marine Sci.,* and *Marine Biol.*

Policy-making Bodies: Chairman, Science and Technology, Kerala Government; Member, Kerala State Planning Board.

Other Contributions: Owing to his efforts, the Central Marine Fisheries Research Institute, and Central Inland Fisheries Research Institute, were established. He established several organizations for research and training in fisheries, viz. Central Institute of Fisheries Technology, Central Institute of Fisheries Education and Central Institute of Fisheries Operatives.

Died 24 June 1977.

PANJA, Ganapati

Elected 1944

Born 13 July 1891
M.B. (1919), University of Calcutta; D. Bact., London School of Dermatology

Specialization: Bacteriology, Pathology

Research Achievements: Panja was a clinician and therapist of legendary repute. His reputation attracted patients from all over India and other Asian countries. Some of his important research contributions were in the fields of seborrhoeic dermatitis, malassezia of the skin, their cultivation, morphology and species, diphtheritic ulcers of the skin, the *garigha* of Chittagong hill tracts, a modified medium for isolation of dysentery, enteric and isolation of vibrios from cholera stool

Positions: Professor of Bacteriology and Pathology, School of Tropical Medicine, Calcutta.

Awards and Honours: Coates Medal (University of Calcutta) (1941); President, Medical and Veterinary Section, Indian Science Congress (Once).

Author/Editor Facet: Panja served as editor of *Indian J. Dermatol.*

Died 1959.

PANSE, Vinayak Govind

Elected 1944

Born 11 January 1906; Maharashtra
Ph.D. (1940), University of London, UK

Specialization: Agricultural Statistics

Research Achievements: Along with J.B. Hutchinson, Panse adapted the randomized block and split plot designs to the plant breeding material and succeeded in the development of replicated progeny and compact family block designs. This was the beginning of more significant contributions to statistical methods in quantitative genetics. Panse took it a great deal farther by introducing appropriate genetic models, which helped bring out the effects of the number of segregating genes, the magnitude of their action, their modification due to dominance and the influence of environment. He evolved a method that resulted in the improvement of forecasts of cotton production in the country. Developed a method of crop- cutting surveys for improving the statistics of acreage and yield of other principal crops. Made significant contributions to the programme and progress of the FAO-sponsored decennial census of agriculture.

Positions: Statistician, Deputy Director and Director, Institute of Plant Industry, Indore; Statistical Adviser to Indian Council of Agriculture Research; Director, Institute of Agricultural Research Statistics; Statistical Adviser, Planning Commission.

Learned and Professional Societies: Secretary, Indian Society of Agricultural Statistics.

Author/Editor Facet: Co-authored 'Statistical Methods in Agricultural Research' (ICAR, 1954); served as editor of *J. Indian Soc. Agric. Statist.*

Other Contributions: Developed yardsticks to assess the progress of agriculture in each state of the country in a series publication 'Index to Experiments'.

Died 1969.

PANT, Divya Darshan

Elected 1972

Born 18 October 1919; Ranikhet, Uttar Pradesh
D.Phil. (1950), University of Allahabad

Specialization: Plant Morphology, Anatomy, Ecology and Palaeobotany

Research Achievements: Pant has established himself as a world authority on *Glossopteris* flora, pteridophytes and gymnosperms in general and cycads in particular. He is also an authority on stomatal development and anatomy of vascular plants. Authored new concepts on classification of gymnosperms, fossil spores and pollen, gametophytic nature of *Rhynia gwynee-vaughani*, phyletic slide of fern annulus and conifer cone evolution. His work is extensively quoted in reviews and textbooks of botany, palaeobotany and palynology.

Positions: INSA Senior Scientist, Head and Senior Professor of Botany and Dean, Science Faculty, University of Allahabad; Executive Councillor, Allahabad and Kumaon universities.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Linnean Society of London, Indian Botanical Society, and Palaeobotanical Society; Emeritus Member, International Society of Plant Taxonomists; Hony Member, International Organization of Palaeobotany; Hony Life Member, Cycad Society of South Africa, Australia and USA.

Awards & Honours: Medallion of Birbal Sahni Institute of Palaeobotany (1971); Birbal Sahni Gold Medal (Indian Botanical Society) (1976); JBS Haldane Oration Award and Medal (1988); Birbal Sahni Centenary Gold Medal (1991); Biennial International Gold Medal (Palaeobotanical Society) (1987); T.S. Sadasivan Lecture Award (INSA) (1990).

Lectureships: Founders Day Lecture, Maharashtra Association for the Cultivation of Science, Pune; Panchanan Maheshwari Memorial Lecture (1971); Birbal Sahni Memorial Lecture (1973); Iyengar Endowment Lecture; Birbal Sahni Centenary Conference Lectures; Platinum Jubilee Lecture (Indian Science Congress).

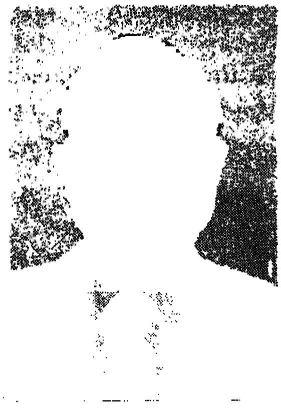
Author/Editor Facet: Authored 'Cycas and Cycadales'; and edited *Phyta.*

Policy-making Bodies: Member, Committee, International Code of Botanical Nomenclature, Leningrad; and Cycad Group Species Survival Commission, International Union for the Conservation of Nature and Natural Resources.

Address: Department of Botany, University of Allahabad, Allahabad 211 002; Tel: (0532) 608064 ; Res: 106, Tagore Town, Allahabad 211 002; Tel: (0532) 600864.

PANT, Narendra Chandra

Elected 1972



Born 20 January 1924; Dehra Dun, Uttar Pradesh
Ph.D. (1960), University of London, UK

Specialization: Economic Entomology

Research Achievements: Pant's research has contributed to our understanding of insect nutrition, insect-microbes symbiosis and insect-plant relationship. His work has shed light on the function of intra-cytoplasmic microorganisms in several insect species. He has shown that in certain beetles, yeast- like microorganisms supply at least 6 factors of vitamin B complex, essential amino acids, and sterols.

Positions: Director (Retd), Commonwealth Institute of Entomology, London (1977); Professor and (later) Head, Entomology Division, Indian Agricultural Research Institute (1956-57).

Learned and Professional Societies: Fellow, Entomological Society of India (President, 1971-72), Royal Entomological Society (London), and Institute of Biology (London).

Author/Editor Facet: Edited two books: 'Economic Entomology' and 'Insect Anatomy and Physiology'; chief edior of *Indian J. Entomol.* and *Bull. Entomol. Res.*; editor of *Rev. Appl. Entomol. (Ser. A & B).*

Address: 56, Queens Gate, London SW7 5JR, UK; Tel: 01-5840067.

PARANJPE, Gopal Ramachandra

Elected 1937

Born 30 January 1891; Karwar, Karnataka
M.Sc.; AIISc, Indian Institute of Science, Bangalore

Specialization: Physics

Research Achievements: Paranjpe orgnized and equipped the laboratories of the Institute of Science, Bombay and took keen interest in instrumentation. His work in physics extended to electrical conductivities, extinction coefficients, homogeneity, Raman effect, and counting of dust nuclei.

Positions: Indian Educational Service; Professor of Physics and Principal; Institute of Science, Bombay.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Institute of Physics (London); Member, Maharashtra Association for the Cultivation of Science, and Indian Standards Institution (now, Bureau of Indian Standards).

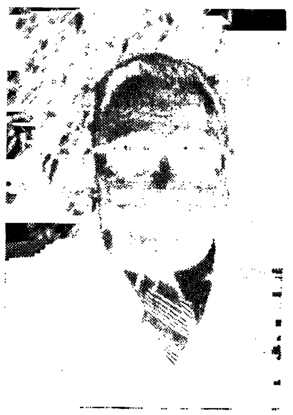
Awards and Honours: OBE.

Author/Editor Facet: Published three books 'Anu Sakti' (1958), 'Paribhasika Vaidnanik Samjna' (1969), and 'Akasa Darsana Atlas' (1972).Founder editor of *Srstijnana* (1928), a popular science magazine in Marathi.

Died 7 March 1981.

PARANJPYE, Raghunath Purushottam

Foundation Fellow



Born 16 February 1876; Ratnagiri, Maharashtra
Mathematics Tripos (1899), University of Cambridge, UK

Specialization: Mathematics

Research Achievements: Paranjpye, the first Indian Wrangler, contributed a great deal to mathematics. A versatile personality, he was a polymath interested in science, education, politics and sports.

Positions: Professor of Mathematics and Principal, Fergusson College, Bombay; Vice-Chancellor, Lucknow University; First Indian High Commissioner to Australia; Vice-Chancellor, University of Poona.

Awards and Honours: Hony Fellow, University of Cambridge, UK.

Policy-making Bodies: Member, Reforms Enquiry Committee and Taxation Committee; Minister, Bombay Cabinet.

Died 6 May 1966.

PARIJA, Pranakrushna

Foundation Fellow

Born 1 April 1891; Cuttack, Orrisa
Tripos Part II, University of Cambridge,UK; D.Sc. *(h.c.)* from Patna and Utkal universities

Specialization: Botany-Plant Physiology

Research Achievements: Parija was a scientist of international repute, a great scholar and an eminent teacher. His research work comprised mainly fundamental and applied aspects of plant physiology, experimental plant morphology, and ecological studies of plant environment. He studied water hyacinth and other aquatic weeds, respiration in leaves and apples, transpiration and heat resistance in plants, rice and algae and storage of apples.

Positions: Indian Education Service; Professor of Botany, Ravenshaw College, Cuttack; Vice-Chancellor, Utkal University (1940-48); Hony Professor of Botany (1949-51); Pro-Vice- Chancellor, Banaras Hindu University, Varanasi (1955-58).

Awards and Honours: OBE; President, Botany Section (1930) and General President (1960), Indian Science Congress; Padma Bhushan (1955).

Policy-making Bodies: Served as MLA, Orissa.

Other Contributions: Architect of Utkal University.Parija's contribution to the development of science and technical education in Orissa is noteworthy.

Died 2 June 1978.

PARIMALA, Raman

Elected 1990

Born 2 November 1948; Mayuram, Tamil Nadu
Ph.D. (1975), University of Bombay

Specialization: Algebra

Research Achievements: Parimala's study of quadratic forms over an affine space began with a counter-example to a quadratic analogue of Serre's conjecture and led to the construction of indecomposable orthogonal bundles on the affine plane. Her extensive study of low-rank quadratic spaces over schemes has led to a deep insight into classical questions concern-ing Durron algebras with involution. The study she made of Witt groups has led, for instance, to far- reaching extensions of a classical theorem of Witt.

Positions: Associate Professor, Tata Institute of Fundamental Research, Bombay; Chancellors' Distinguished Professorship at University of California, Berkeley, USA (1990-91).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1987).

Address: Associate Professor, School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152971; Res: 803, Bhaskara, TIFR Housing Colony, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152853.

PARKINSON, P.E.

Elected 1936

PARODA, Rajendra Singh

Elected 1986

Born 28 August 1942; Ajmer, Rajasthan
Ph.D.(1968), Indian Agricultural Research Institute, New Delhi; D.Sc (*h.c.*), C.S. Azad University of Agriculture and Technology, Kanpur

Specialization: Genetics and Plant Breeding

Research Achievements: Paroda has evolved about a dozen varieties of different crops, including forages, which have been released at the national level. His contributions in biometrical genetics, especially genotype x environment interactions, genetic architecture of yield attributes and synchrony traits are well recognized. Equally recognized is his work on plant genetic resources and their conservation in India. Paroda's work on genetic improvement in regard to forage yield and quality attributes in sorghum, oats, guar and cowpea has also been well recognized.

Positions: Regional Plant Production and Protection Officer, FAO Regional Office for Asia and the Pacific, Bangkok (currently); Deputy Director General (Crop Sciences), Indian Council of Agricultural Research, New Delhi; Director, National

Bureau of Plant Genetic Resources, New Delhi; Additional Director of Research, Haryana Agricultural University (HAU), Hissar; Professor and Head, Department of Plant Breeding, HAU.

Learned and Professional Societies: Fellow, National Academy of Sciences, (India), Indian Society of Genetics and Plant Breeding (President, 1985-87), and Crop Improvement Society of India; Founder Fellow, National Academy of Agricultural Sciences (India); President, Indian Society of Plant Genetic Resources (1987-92); and of other professional bodies.

Award and Honours: Team Research Award ICAR (1983-84); Rafi Ahmed Kidwai Memorial Prize (1982-83); FICCI Award (1988); Aisman Award (1988); Om Prakash Bhasin Award (1992).

Lectureships: Dr. Chalam Memorial Lecture (Tamil Nadu Agricultural University) (1991).

Author/Editor Facet: Edited six books and served as editorial board member of four journals including *Curr.Sci.* and *Indian J. Agri. Sci.*, and *Forage Res.*

Policy-making Bodies: Member, Board of Trustees, International Rice Research Institute, Philippines (1990- ; International Rice Genetics Cooperative, Japan (1992-) ; Member, International Committee for Plant Genetic Resources, National Academy of Sciences, Washington (1990-); Regional Secretary for South Asia, Society for Advancement of Breeding Research in Asia and Oceania, Japan (1990).

Other Contributions: Established the first national gene bank in 1985, and started the national hybrid research project in 1990.

Address: Regional Plant Production and Protection Officer, FAO Regional Office for Asia and the Pacific, Phra Atit Road, Banglampoo, Bangkok 10200, Thailand; Tel: 2817844;Cable: FOODAGRI BANGKOK; Telex: 82815 FOODAG TH; Fax: (662) 2800445.

PARTHASARATHY, Kalyanapuram Rangachari *Elected 1976*

Born 25 June 1936; Madras, Tamil Nadu
Ph.D. (1962), Indian Statistical Institute, Calcutta

Specialization: Probability, Quantum Mechanics

Research Achievements: Parthasarathy's contributions relate to: (i) integral representation for entropy of sources and rates of information transmission in channels; (ii) examples where ergodic measures are weakly dense in the convex set of privariant probability measures; (iii) Levy-Khinchine theorems for probability distributions in groups; (iv) study of representations of complex semisimple Lie algebras; and (v) development of quantum stochastic calculus. Many of these works have been done in collaboration with other scientists.

Positions: Distinguished Scientist, Indian Statistical Institute (ISI), Delhi (1984-); Senior Professor,ISI, Delhi (1976-84); Senior Professor, IIT, Delhi (1973-76); Professor, University of Bombay (1970-73) ; Professor, University of Manchester Statistical Laboratory,UK.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India); Member, INSA Council (1983-85).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1976); President, Statistics Section, Indian Science Congress (1992).

Lectureships: Platinum Jubilee Lecture, (Indian Science Congress) (1991).

Author/Editor Facet: Written two books: 'Probability Measures in Metric Spaces' (Academic Press 1967); and 'An Introduction to Quantum Stochastic Calculus' (Birkhauser, Basel). editor of *Sankhya*; member, editorial boards of: *Proc.Indian Acad. Sci.* (*Math. Sci.*); *Adv. Appl. Probab.*; served on editorial board of *Probability Related Fields.*

Policy-making Bodies: Member, National Board for Higher Mathematics; President, Association of Mathematics Teachers of India; Member, National Committee for Mathematics, International Mathematical Union, and Executive Committee, International Association of Mathematical Physicists.

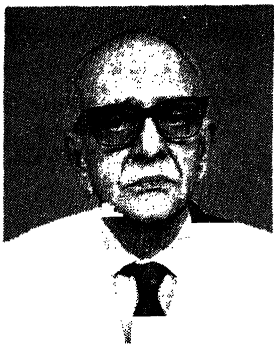
Address: Distinguished Professor, Indian Statistical Institute, 7, S.J.S. Sansanwal Marg, New Delhi 110 016; Tel: (011) 664741; Gram: Statistica, New Delhi; Fax 91-11-665403; Telex: 031-73274 ISI IN E-mail: krp @ isid.ernet.in; Res: A-2, Staff quarters, ISI Delhi Campus,New Delhi 110 016; Tel: (011) 660872.

PARTHASARATHY, Navalpakkam

Elected 1949

Born 4 August 1900
Ph.D. (1938), University of London, UK

Specialization: Agriculture, Plant Genetics



Research Achievements: Parthasarathy's significant research achievements related to induction of mutations for the first time in rice by X-irradiation. The cytology and genetics of sugarcane and rice were his fields of interest to which he made substantial contributions. He and his coworkers isolated and studied haploids and polyploids in rice and obtained twin plants with different chromosome numbers. This piece of research opened up a series of studies on other twin plants.

Positions: Geneticist and Head, Division of Botany, Indian Agricultural Research Institute, New Delhi; Geneticist and Second Cane Breeding Officer, Sugarcane Breeding Institute, Coimbatore; Director, Central Rice Research Institute, Cuttack; Rice Expert, FAO, Indonesia; Rice Improvement Specialist for the Far-East and Executive Secretary, International Rice Commission; Rice Adviser, Governments of Liberia and Thailand.

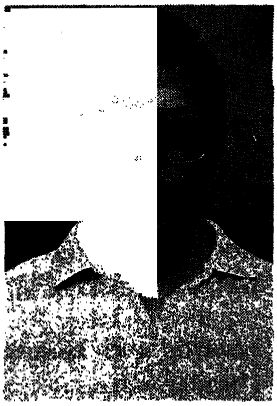
Learned and Professional Societies: Fellow, Tamil Nadu Academy of Sciences; President, Indian Society of Genetics and Plant Breeding (1953,1970); working President, Madras Science Foundation; Member, INSA Council (1976-78).

Awards and Honours: President, Agricultural Section, Indian Science Congress (1953); Gold Medal, Rural Development Agency of South Korea; Padma Shri (1958).

Died 1 April 1993.

PARTHASARATHY, Rajagopalan

Elected 1985



Born 6 October 1945; Madras, Tamil Nadu
Ph.D. (1974), University of Bombay

Specialization: Representations of Lie Groups

Research Achievements: Parthasarathy's first piece of work which won peer recognition was on the explicit realization of discrete series in the space of square integrable solutions of the Dirac operator on the symmetric space associated with the semi-simple Lie group *G*. This realization on the space of harmonic spinors and the formula for the square of the Dirac operator that he proved are being used extensively by workers in this field. He also proved a vanishing theorem in the case of holomorphic discrete series. With R. Hotta, he studied the spectrum of $L^2(G/\Gamma)$, where Γ is a co-compact discrete subgroup of G. Now working on the construction of Harish-Chandra modules. Proved a unitarisability theorem.

Positions: Professor, School of Mathematics, Tata Institute of Fundamental Research, Bombay.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards & Honours: Shanti Swarup Bhatnagar Prize (1985)

Address: Professor, School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Bombay 400 005; Tel: (022) 2152971 (Ext 334); Res: 301, Meghanad, TIFR Housing Colony, Homi Bhabha Road, Colaba, Bombay 400 005.

PARTHASARATHY, Sarangapani *Elected 1952*

Born 15 March 1904; Madurai, Tamil Nadu
D.Sc. (1934), University of Bombay

Specialization: Ultrasonics

Research Achievements: Parthasarathy made extensive studies in the field of classical scattering of light, Raman effect, and X- ray diffraction, and physics of corrosion and in ultrasonics in which he was Considered an authority. Established a correlation between depolarization factor and chemical constitution after critically examining the scattering of light by gases and vapours. Propounded a molecular theory of scattering of light by binary liquid mixtures taking account of both optical anisotropy of the molecules and the anisotropy of the Lorentz polarization field which effectively diminishes the molecular optical anisotropy. His work on the equivalence of sonic and thermal energies opened up a new branch of ultrasonics: thermosonics.

Positions: Assistant Director and Head, Division of Sound, National Physical Laboratory,New Delhi.

Learned and Professional Societies: Fellow, Institute of Physics (London) and Royal Institute of Chemistry (Great Britain and Ireland); Special Fellow, Nobel Institute (Stockholm).

Awards and Honours: President, Physics Section, Indian Science Congress (1960).

Other Contributions: Parthasarathy was the representative of the Government of India on the British Mission which was sent to Japan by the British Chiefs of Staff to report on the physical damage done by atom bombs at Hiroshima and Nagasaki.

Died 1962.

PASRICHA, Lt. Col. Chiranjilal

Elected 1939

Born 9 September 1897; Mariwalla, Punjab
M.B. (1923), University of Canterbury, UK

Specialization: Medical Science

Research Achievements: Pasricha made extensive researches on the cholera bacteriophage. Discovered and described more than 15 types of choleraphage. Using the choleraphage he transformed the classical cholera vibrio into eltor type, showing the mutagenic relationship between the two types of organism. He also employed choleraphage in the treatment of cholera. He extended his studies to typhoid and dysentery phages and to the treatment of bacillary dysentery by phage. Attempted treatment of cholera with newly developed sulphonamides.

Positions: Indian Military Service (1925); Professor of Pathology and Bacteriology, School of Tropical Medicine, Calcutta.

Learned and Professional Societies: Fellow, Royal Society of Medicine (London).

Awards and Honours: Minto Medal, (School of Tropical Medicine, Calcutta) (1939).

Died 11 January 1958.

PASSI, Inder Bir Singh

Elected 1989

Born 20 August 1939; Bilaspur, Haryana
Ph.D. (1966), University of Exeter, UK

Specialization: Algebra

Research Achievements: Passi's main interest is the study of group rings to which he has made many contributions. The structure of augmentation quotients, the identification of dimension subgroups, a filtration of Schur multiplicator, relation modules and Lie structure of group rings are some of the topics he has investigated.

Positions: Professor, Department of Mathematics, Panjab University, Chandigarh, Visiting Professor, University of California, Los Angeles (USA) (1988-89).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Naional Academy of Sciences (India).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1983); Meghnad Saha Award (1988).

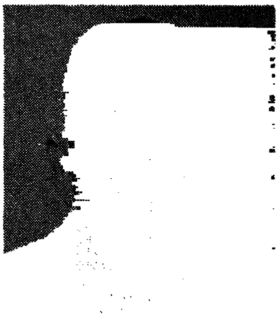
Author/Editor Facet: Passi's research monograph 'Group Rings and Their Augmentation Ideals, LNM 715' (Springer-Verlag, 1979) is a standard reference in the subject.; Served as editor of *J. Indian Math. Soc.* (1985-91).

Policy-making Bodies: Member, National Board for Higher Mathematics (1989-).

Address: Professor, Department of Mathematics, Panjab University, Chandigarh 168 014; Tel: (0172) 541132; Telex: 395 464 RSIC IN; Res: 381, Sector 38/A, Chandigarh; Tel: (0172) 21224.

PATEL, Chunibhai Chhotabhai

Elected 1978



Born 17 March 1920; Nadiad, Gujarat
Ph.D. (1950), University of Bombay

Specialization: Inorganic Chemistry, Mineral Chemistry, Spectroscopy

Research Achievements: Patel determined the bonding and structure of a number of newly synthesized metal complexes. Investigated the chemistry, spectroscopy and electronic structure of thiocarbonyl compounds. Used thermodynamic calculations to explain selective chlorination of minerals. Explained the biological activity of certain molecules using molecular orbital calculations.

Developed methods for selective flotation of minerals.

Positions: Associate Professor (1967-70), Professor (1970-80) and Chairman (1977-80), Department of Inorganic and Physical Chemistry, Indian Institute of Science, Bangalore.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

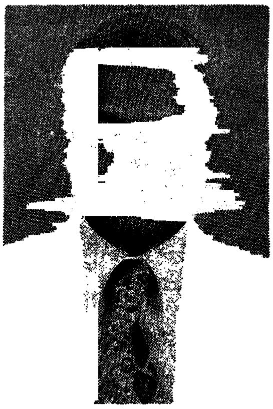
Authored/Editor Facet: Served on editorial board of *Indian J. Chem.*

Died 15 December 1987.

PATNAIK, Lalit Mohan

Elected 1992

Born 22 July 1946, Kasinagar, Orissa
D.Sc. (1989), Indian Institute of Science (IISc), Bangalore



Specialization: Computer Science and Engineering

Research Achievements: Patnaik has made notable contributions to the design of: (i) an original parallel architecture called extended hypercube; (ii) novel parallel algorithms and architectures for neural network simulation, robotic motion planning, VLSI layout, and scientific visualization; (iii) characterization methods of symbolic computation based on Grobner basis reduction; (iv) a novel formalism based on temporal logic for the specification and verification of real-time distributed computing systems; (v) elegant modelling techniques of genetic algorithms; (vi) Petri-net based performance evaluation tools for high-performance computing; and (viii) Fokker Planck-based coloured noise characterization of nonlinear dynamic systems.

Positions: Professor, Department of Computer Science & Automation, (1986-), Convener, Microprocessor Applications Laboratory (1987-), IISc, Bangalore.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India) Indian National Academy of Engineering, Institute of Electrical and Electronics Engineers (IEEE), Institution of Engineers (India) and Institution of Electronics and Telecommunication Engineers (IETE) ; Chairman, Computer Society of India Chapter and IEEE, Bangalore Section; Founder Member, Association for Advancement of Fault-Tolerent and Autonomous Systems, VLSI Society of India, and Indian Transputer User Group.

Awards and Honours: Hari Om Ashram Trust Prerit Dr Vikram Sarabhai Award (1989); Ram Lal Wadhwa Award (IETE) (1992).

Lectureships: IEEE (USA) Region 10 Distinguished Lecturer.

Author/Editor Facet: Patnaik has been member of the editorial boards of several journals, mostly international, devoted to computer science; editor, *Comp. Sci. Informat.*

Policy-making Bodies: Member, Technical Panel on Photonics Computing, Department of Electronics,; and Engineering Sciences Research Committee, CSIR.

Address: Professor, Department of Computer Science & Automation, Supercomputer Education and Research Centre, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2520), 342451; Telex: 0845-8349 IISc IN; Fax: 91-812-341683; E-Mail: lalit@micro.iisc. ernet.in; Res: Apartment NO 313, Sriniket Apartments, 19/8 Ist Cross, M.S. Ramiah College Road, Mathikere, Bangalore 560 054; Tel: (080) 344568.

PATWARDHAN, Vinayak Narayan *Elected 1958*

Born 10 January 1905; Allahabad, Uttar Pradesh
Ph.D., University of London, UK

Specialization: Nutrition Science

Research Achievements: Patwardhan was an acknowledged nutrition expert in India. He investigated, among others, (i) influence of vitamin D on the metabolism of calcium and phosphorus; (ii) nutritive value of vegetable proteins; (iii) protein utilization and requirements; and (iv) protein malnutrition. Elucidated the role of essential fatty acids in aetiology of phrynoderma. During his tenure in WHO, Patwardhan participated in worldwide studies of iron deficiency, nutritional anemias and avitaminosis A.

Positions: Professor of Nutrition, Vanderbilt University; Assistant Director for Nutrition, USA and Biochemistry and Head of Nutrition Department, US Naval Medical Research unit 3; Chief of Nutrition, World Health Organization, Geneva; Director, Nutritional Research Laboratories, Coonoor and Hyderabad (1946- 60).

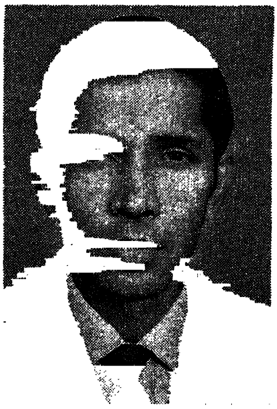
Learned and Professional Societies: Hony Member, American Institute of Nutrition.

Author/Editor Facet: Authored 'Nutrition in India' (IED, 1952, II ed., 1961), rated as a classic of the 50s.

Died 8 July 1971.

PAUL, Dalim Kumar

Elected 1993



Born 1 October 1939; Nowgong, Assam
D.Sc. (1993), University of Calcutta

Specialization: Geochemistry, Isotope Geology, Petrology

Research Achievements: Paul's research has established chemical and mineralogical heterogeneity in the earth's mantle in different scales and highlighted the role of disequilibrium melting. He has generated high-quality isotopic and geochemical data of the Indian Precambrian rocks and contributed to our knowledge of the early crustal evolution. On the basis of petrological and isotopic research he has elucidated the chronology and petrogenesis of flood basalts of India.

Positions: Deputy Director General (1992-), Director (Geology) (1977-92), Geological Survey of India; Senior Gledden Fellow, University of Western Australia (1987); Lecturer (for short term), IIT, Kharagpur and Jadavpur University.

Learned and Professional Societies: Fellow, Geological Society of India, Geological Society of London, Indian Association of Mass Spectrometry.

Awards and Honours: National Mineral Award (1988-89).

Author/Editor Facet: Edited *GEOS* (IIT) (1960), and a few seminar volumes.

Policy-making Bodies: Convenor, Scientific Committees (two), International Geological Correlation Programme and National Committee on Lithosphere Programme.

Address: Geological Survey of India, 27, Jawaharlal Nehru Road, Calcutta 700 016; Tel: (033) 296993; Telex: 0215967; Fax: 91-33-296956; Res.: BF 217 Salt Lake, Calcutta 700 064; Tel: (033) 374673.

PAUL, Ram Chand

Elected 1967

Born 20 October 1919; Shakargarh, Pakistan
Sc.D. (1968), Cambridge University, UK

Specialization: Inorganic and Physical Chemistry

Research Achievements: At Cambridge Paul worked on fluorine chemistry. Started research on non-aqueous solvents, then a new field in India. Worked on the

chemistry of uranium and other elements. He and his coworkers standardized the solution chemistry of a large number of solvents such as acid halides, amides, and strongly protonic acid media.

Positions: Vice-Chancellor (1974-84), Professor and Head, Chemistry Department (1959-74), Panjab University, Chandigarh.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Royal Institute of Chemistry (London), and Indian Chemical Society; Member, INSA Council (1971-73,1981).

Awards & Honours: UGC National Lecturer (1970-71).

Author/Editor Facet: Authored 'Non-aqueous Solvents' (in Hindi, Rajasthan Academy); contributed chapters on chemistry of non- aqueous solvents to two volumes (Academic Press) and authored a book on fluorine chemistry (Wiley-Eastern).

Policy-making Bodies: President, Association of Indian Universities (1983); Member, Governing Body of CSIR and IARI, Indian Agriculture Research Review Committee; Executive Council of Association of Commonwealth Universities (1978-79, 1983-84).

Other Contributions: Helped modernize of the chemistry curriculum at school and college levels, under the sponsorship of NCERT and COSIP.

Address: Emeritus Professor, Department of Chemistry, Panjab University, Chandigarh 160 014; Tel: (0172) 541435; Res: 695, Sector 8B, Chandigarh 160 018; Tel: (0172) 25586.

PENMAN, David

Foundation Fellow

Born 1883
D.Sc. (Engng), University of Edinburgh, UK

Specialization: Mining Engineering, Geology

Research Achievements: Penman's work on mines with regard to ventilation, cold dust danger, crushing strength of coal pillars, etc. was well known. He was an authority on the principles and practices of coal mining.

Positions: Fife Education Committee (1919-20); Inspector of Mines, Government of India (1921-26); Principal, Indian School of Mines, Dhanbad (1926-32); Chief Inspector of Mines, Government of India (1932-49).

Learned and Professional Societies: Fellow, Royal Society of London, Institute of Mining Engineers, and Geological Society of London.

Awards and Honours: CIE (1937); President, Geology Section, Indian Science Congress (1930).

Other Contributions: Penman was interested in the geology education of India and also wrote on the importance of minerals and economy.

Died 24 August 1961.

PERCIVAL, Frederich George

Elected 1936

Ph.D., University of London

Specialization: Geology, Mining Engineering

Research Achievements: Percival was one of the main architects of geological activities in British India.

Positions: Superintendent of Mines and Quarries, Tata Iron and Steel Co. Ltd.

Learned and Professional Societies: Fellow, Geological Society (London); Vice-President (1932) and President (1933- 34), Mining and Geological Institute of India.

Awards and Honours: OBE.

Died (Date N.A.)

PETERS, Bernard

Elected 1958

Born 22 December 1910; Poznan, Poland
Ph.D. (1942), University of California, Berkeley, USA

Specialization: Cosmic Rays and Particle Physics, Geophysics, Astrophysics

Research Achievements: Peters made significant contributions in the field of cosmic ray and particle physics, geophysics, and astrophysics. His work with Bradt established the existence of nuclei of atoms of helium, carbon, magnesium and iron in the primary cosmic radiation. He and his coworkers at TIFR made technical advances in using stacked stripped emulsions an innovation which led to important discoveries in the field of new unstable elementary particles.

Positions: Director, Danish Space Research Institute; Professor of Experimental Physics, Tata Institute of Fundamental Research, Bombay.

Learned and Professional Societies: Fellow, Royal Danish Academy of Sciences, and Indian Academy of Sciences, American Physics Society; Hony Fellow, Tata Institute of Fundamental Research.

Died 2 February 1992.

PHILPOT, H.P.

Foundation Fellow

Professor of Mechanical Engineering, Banaras Hindu University (BHU), Varanasi; First Principal, Engineering College, BHU.

Died (Date N.A.)

PICHAMUTHU, Charles Solomon

Elected 1942

Born 10 March 1900; Kallupatti, Tamil Nadu
Ph.D. (1936), D.Sc. (1948), University of Glasgow, UK

Specialization: Precambrian Geology

Research Achievements: Pichamuthu's seminal work shed light on several fundamental problems concerned with the evolution of the continental crust, greenstone belts, charnockites, gneisses, and granites of Karnataka.

Positions: Professor of Geology, Universities of Mysore, Malaya, Andhra and Bangalore; Director, Mines and Geology, Karnataka.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Member, Royal Society of Edinburgh, Geological Societies of London and India (sometime President) and Society of Economic Geologists of India; President, Geological, Mining and Metallurgical Society of India; and Science Society of Malaya; Member, INSA Council (1973-75).

Awards and Honours: Mysore Geologists' Association Gold Medal (1972); Pramatha Nath Bose Medal (Asiatic Society) (1974); President, Geology and Geography Section, Indian Science Congress (1947).

Lectureships: Golden Jubilee Lecture (Geological, Mining and Metallurgical Society of India) (1974).

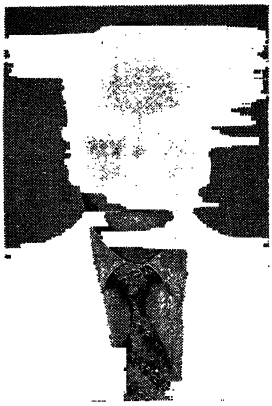
Policy-making Bodies: Chairman, Sri Gomateswara Renovation Research Committee, Government of Karnataka.

Died 18 August 1990.

PILLAI, Madathil Keralakurup Krishna

Elected 1986

Born 16 March 1932; Narakathara, Kerala
Ph.D. (1964), University of Western Ontario,London, Canada



Specialization: Entomology - Insect Toxicology and Environmental Toxicology

Research Achievements: Pillai has elucidated the biochemical and genetical mechanisms of DDT-, Organo-phosphorus and deltamethrin resistance in mosquitoes. Has investigated structure-activity relationship of variously substituted aziridinyl compounds and phosphoramides to establish their sterilizing potential in mosquitoes. By using nuclear techniques he has demonstrated that DDT and HCH have much shorter half-lives in tropical soils than in temperate soils.

Positions: Professor of Zoology (1978-), Head, Department of Zoology (1984-87), Dean, Faculty of Science (1987) all at University of Delhi.

Learned and Professional Societies: Fellow, Entomological Society of India.

Author/Editor Facet: Member, editorial boards of *J. Biochem. Toxicol.*; and *Entomon.*

Policy-making Bodies: Member, Scientific Advisory Committees Malaria Research Centre, Delhi; Vector Control Research Centre, Pondicherry; and Regional Medical Research Centre, Bhubaneswar; Pesticides Pollution Advisory Committee, Government of India; also served as member of project Advisory/Review Committees of DST and ICMR and UGC postgraduate curriculum development committee.

Address: Professor, Department of Zoology, University of Delhi, Delhi 110 007; Tel: (011) 7257443; Res: C-12, Maurice Nagar, Delhi 110 007; Tel: (011) 2923690.

PINFOLD, E.S.

Foundation Fellow

M.A.

Specialization: Petroleum Geology

Research Achievements: Pinfold made notable contributions to geological sciences, particularly petrology and petroleum technology.

Positions: Geologist, The Attock Oil Co. Ltd., Rawalpindi

Learned and Professional Societies: Fellow, Geological Society (London).

Died (Date N.A.)

PISHAROTY, Pisharoth Rama

Elected 1978

Born 10 February 1909; Kollengode, Kerala
Ph.D. (1954), University of California, Los Angles,USA

Specialization: Meteorology, Earth Resources, Remote Sensing

Research Achievements: Pisharoty has found that : (i) mid-latitude low-pressure systems moving eastward across the northern Himalaya cause (a) a break in the monsoon rains over a major part of India, (b) recurvature of monsoon depressions in late August and September towards western Himalaya, leading to very heavy rains there; (ii) the Indian summer monsoon is a delayed response to the inadequate poleward transport of heat in the northern hemisphere during the antecedent winter;

and (iii) a significant part of the moisture for an active monsoon period arises through evaporation from the Arabian Sea.

Positions: Director, Indian Institute of Geomagnetism, Bombay, Indian Institute of Tropical Meteorology, Pune, and Remote Sensing and Meteorology Division, Space Application Centre, ISRO, Ahmedabad; Senior Professor, Physical Research Laboratory, Ahmedabad.

Learned Societes: Fellow, Royal Meteorological Society, American Meteorological Society and Indian Academy of Sciences; Vice- President, International Association for Meteorology and Atmospheric Physics; (sometime) President, Indian Meteorological Society.

Awards and Honours: C.V. Raman Centenary Medal Indian Association for the Cultivation of Sciences (1988), IMO Prize (World Meteorological Organization) (1989), K.R. Ramanathan Medal (INSA) (1990); *Ponnada* (Government of Kerala) (1987);Padma Shri (1970).

Author/Editor Facet: Authored 7 books including 'C.V. Raman' (1982), 'Satellite Story' (1985), 'Meteorology for Indian Farmers' (1986), 'Climate of Kerala' (in Malayalam, 1992) and ' Tropical Cyclone' (1993); served on the editorial board of *Mausam.*

Policy-making Bodies: Member, INCOSPAR; Scientific Advisory Committee (President) for World Meteorological Organization; Joint Organizing Committee for Global Atmospheric Research Programme (1968-76); and Indo-US Collaborative Programme for Science and Technology.

Other Contributions: Pisharoty was primarily responsible for introducing remote sensing technology in India

Address: E 2, Chaitraban Residency, ITI Road, Aundh, Pune 411 007; Tel: (0212) 349996.

PRADHAN, Shyamsundarlal *Elected 1966*

Born 13 May 1913; Dihwa, Uttar Pradesh
D.Sc. (1938), University of Lucknow; Ph.D. (1948), University of London, UK

Specialization: Entomology

Research Achievements: Pradhan came up with fundamental generalizations on the dynamics of temperature effect (named after him) on insect development . He invented a biometer and standardized techniques for population study. His other works relate to: biotic theory of locust cycle; effect of temperature on the susceptibility of insects to insecticides; effect of particle size on the toxicity of insecticides; differentiation between external and internal resistance of insects to fumigants; correlation between insecticide solubility in enticular lipoids and insect resistance to insecticides; correlation between epicuticular structure of insects and their resistance to insecticides; mode of action of DDT; neem as an insect repellant; and ecological manipulation for safe storage of foodgrains.

Positions: Head, Division of Entomology, Indian Agricultural Research Institute, New Delhi.

Learned and Professional Societies: Fellow, Royal Entomological Society and Entomological Society of India (President for four terms).

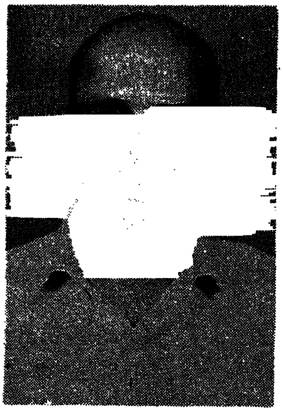
Awards and Honours: Hari Om Ashram Trust Award (1973).

Other Contributions: Pradhan was an acknowledged radio broadcaster on agricultural innovations and developments.

Died 5 February 1973.

PRADHAN, Suresh Krishnarao

Elected 1989



Born 6 September 1929 ; Nagpur, Maharashtra
Ph.D.(1958), University of London, UK

Specialization: Organic Chemistry

Research Achievements: Pradhan has explained the stereochemistry and established the mechanism of cycloalkanone reduction by alkali metals. Also established the mechanism of Stork reductive cyclization. Discovered a very rare case of very fast interconversion of configurational isomers.

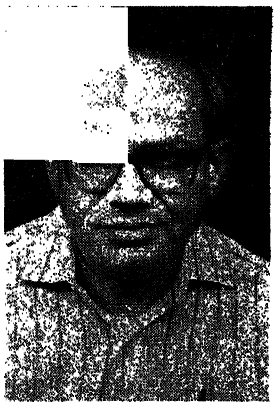
Positions: Professor and Head, Pharmaceuticals Division, University Department of Chemical Technology, University of Bombay; Project Leader and Scientist, Indian Institute of Chemical Technology, Hyderabad; Head, Chemistry Department, Shivaji University; Scientist, Worcester Foundation for Experimental Biology, Shrewsbury, Massachusetts, USA.

Learned and Professional Societies: Fellow, Indian Academy of Sciences. Member, Sigma Xi (USA), and Chemical Society, (London);

Author/Editor Facet: Member, board of consulting editors for *Tetrahedron* and *Tetrahedron Lett.*

Address: A-32 Building No.11, Jankalyan Nagar, Malad (West),Bombay 400 095;
Tel: (022) 8072866.

PRAKASA RAO, Bhagavatula Lakshmi Surya *Elected 1984*



Born 6 October 1942; Porumamilla, Andhra Pradesh
Ph.D. (1966), Michigan State University, USA

Specialization: Probability and Statistics

Research Achievements: Prakasa Rao has studied the asymptotic distribution of the maximum likelihood estimator for location of the cusp for families of densities which include double exponential densities by using, for the first time, the theory of weak convergence on complete separable metric spaces due to Prohorov. He has shown that the estimators are hyperefficient. With regard to estimation for unimodal density and monotone failure rate, he developed the basic distribution theory for the study of asymptotic distribution of maximum likelihood estimators and proved that these estimators are not efficient as in the classical parametric case. Established that classical results on the rates of convergence and asymptotic distributions for the maximum likelihood and Bayes estimators continue to hold for discrete time stationary Markov processes, satisfying Doeblin's condition and for a class of diffusion processes. He proved, in collaboration with Kallianpur and Borwanker, that the posterior density converges to the normal density in mean for smooth prior distribution even in the case of discrete time-stationary Markov processes, thereby extending the classical Bernstein von Mises theorem. Contributed extensively to the parametric and nonparametric asymptotic theory of statistical inference for stochastic processes and limit theorems and characterization problems in probability theory.

Positions: Director, Indian Statistical Institute (1992-); Distinguished Scientist, Indian Statistical Institute (1992-); Jawaharlal Nehru Centenary Professor (1992), University of Hyderabad.

Learned and Professional Societies: Fellow International Statistical Institute, Institute of Mathematical Statistics (US), and Indian Academy of Sciences.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1982); UGC National Lecturer (1985-86).

Lectureships: Platinum Jubilee Lecture (Indian Science Congress) (1993).

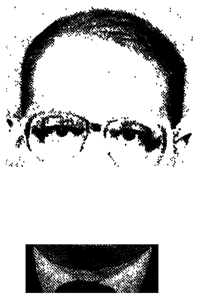
Author/Editor/Facet: Authored/co-authored 'Statistical Inference for Stochastic Processes' (Academic Press, 1980) ; contributed comprehensive works on 'Nonparametric Functional Estimation' (Academic Press, 1983) and 'Asymptotic Theory of Statistical Inference' (Wiley, 1987); written 'Identifiability in Stochastic Models' (Academic Press, (1992); translated and edited the book on 'Parameter Estimation for Stochastic Processes'; Editor of Publications, INSA (1991-93).

Address: Director, Indian Statistical Institute, 203 B.T. Road, Calcutta 700 035; Tel: (033) 52-9330 (Off); E-mail: shakti!ncst.ernet.in!isical!blspr; Tel: (033) 521305, 528597 (Res).

PRAKASH, Ishwar

Elected 1982

Born 17 December 1931; Jaipur, Rajasthan
D.Sc.(1983), University of Rajasthan, Jaipur



Specialization: Vertebrate Ecology, Wildlife Conservation, Rodent Pest Management

Research Achievements: Prakash has carried out pioneering research on the ecology of desert vertebrates, environmental analysis and desertification. His researches have ranged from faunistic studies to biochemical communication among desert rodents, physiology of desert survival and wildlife conservation to rodent pest management. He is considered to be an authority on desert ecology.

Positions: INSA Senior Scientist (1992), Professor of Eminence (1980-91), Coordinator and Principal Animal Ecologist (1977-80), Central Arid Zone Research Institute, Jodhpur; Professor of Eminence (ICAR) (1980).

Learned and Professional Societies: Fellow, National Academy of Sciences (India) and National Academy of Agricultural Sciences (India); Foreign Fellow, International Theriological Congress, Russian Academy of Sciences.

Awards and Honours: Rafi Ahmed Kidwai Memorial Prize (ICAR) (1975); Har Swaroop Memorial Lecture Award (INSA) (1991).

Author/Editor Facet: Authored edited 17 books and monographs; editor, *Ann. Arid Zone*; member, editorial board, *J. Arid Environ.*

Policy-making Bodies: Member, FAO Panel on Vertebrate Pests and Rodents, IUCN Group of Conservation Specialists, National Committee on Problems of Environment (SCOPE), INSA and on many technical committees of CSIR, Entomological Panel, ICAR, Project Advisory Committee of DST, Man and Biosphere Committee, Ministry of Environment and Forest, Environment Science Committee, UGC, Rajasthan Wildlife Board, Bombay Natural History Society etc.

Other Contributions: Established the discipline of rodentology on a firm basis in the country; also Established schools of learning on desert vertebrates, rodent pest management, wildlife ecology, and biochemical communication.

Address: INSA Senior Scientist, Zoological Survey of India, Paota B Road, Jodhpur 342 010; Tel: (0291) 45144; Res: Vidya Kailash, Near Sati Mata Temple, Ratanada, Jodhpur 342 001; Tel: (0291) 31654.

PRAKASH, Satya

Elected 1983

Born 1 July 1929; Najibabad, Uttar Pradesh
Ph.D. (1958), Gujarat University, Ahemdabad

Specialization: Aeronomy and Space Plasmas

Research Achievements: Prakash's contributions relate to solar modulation of cosmic ray neutrons at the geomagnetic equator; equatorial electrojet associated electric field, irregularities in electron density and electric field, their classification, properties and generation through gradient drift and two-stream instability, neutral and vehicle-induced turbulence and gravity waves; and generation and transmission of electric field by gravity waves in the upper atmosphere.

Positions: Chairman, Aeronomy Area, Physical Research Laboratory, Ahmedabad.

Learned and Professional Societies: Fellow, National Academy of Sciences (India) and Indian Academy of Sciences; Member, Astronautical Society of India.

Awards and Honours: Hari Om Prerit Vikram Sarabhai Award (1974); Padma Shri (1982).

Other Contributions: Development of spaceworthy aeronomy payloads launched on rockets from Thumba and SHAR and on Aryabhatta; development and establishment of VHF backscatter radar at Thumba; design and development of Indian MST radar now operating near Tirupati; establishment of vacuum ultraviolet group and experimental plasma physics group at PRL; participation in the Indian IMAP programme.

Address: Emeritus Scientist (CSIR), Physical Research Laboratory, Navrangpura, Ahmedabad 380 009; Tel: (0272) 462129; Telex: 0121-6397; Fax: 91-272-460502; E-mail: root.prl.ernet.in; Res: 395, Saraswati Nagar, Ahmedabad 380 015; Tel: (0272) 641823.

PRAMANICK, Sunil Kumar

Elected 1952

Born 7 January 1899
Ph.D. (1926), University of London, UK

Specilization: Meteorology

Research Achievements: Pramanick worked on problems in terrestrial magnetism and meteorology. His work on six-hourly variations of atmospheric pressure and temperature, involving a worldwide survey of data, brought out the important features of these elements. He made notable contributions also to hydrology and hydrometeorology.

Positions: Meteorologist, India Meteorological Department (1927- 45); Director, Regional Meteorological Centre (IMD) (1945-47) ; and Deputy Director-General of Observatories, New Delhi and Pune (1947-54).

Learned and Professional Societies: Member, International Association of Geomagnetism and Aeronomy

Other Contributions: Pramanick's expertise was of great help in setting up the new Iranian Meteorological Department and in organizing of meteorological work in that country.

Died 5 February 1957.

PRASAD, Badri Nath

Elected 1936

Born 12 January 1899; Azamgarh, Uttar Pradesh
Ph.D. (1931), University of Liverpool, UK; D.Sc. (1932), University of Paris, France

Specialization: Pure Mathematics

Research Achievements: Prasad worked extensively on modern analysis including diverse subjects theory of Fourier series, its conjugate and divided series: theory and application of absolute summability of infinite series in general; summability factors, Fourier integrals, and radial variation.

Positions: Professor (1946-49, 1951-61), Head (1958-61), Department of Mathematics, University of Allahabad; Professor and Head (1949-51), Department of Mathematics, Science College, Patna.

Learned Society: Member, Calcutta Mathematical Society (Vice- President), *Vijnan Parishad* (Vice-President), *Bharat Ganita Parishad* (Member, Managing Committee) Indian Mathematical Society (President, 1961 and Life Member), London Mathematical Society, American Mathematical Society, and Allahabad Mathematical Society (President, 1966); Fellow, National Academy of Sciences (India) (President, Physical Sciences Section 1960, Vice-President and President, 1965- 66).

Awards and Honours: President, Mathematics and Statistics Section (1944-45), General Secretary outstation (1952-55, 1958-61) and President (1965-66), Indian Science Congress; Padma Bhushan (1963).

Author/Editor Facet: Wrote a book 'Hydrostatics' (translated into Marathi and Hindi).

Policy-making Bodies: Member, Rajya Sabha (1964-65)

Other Contributions: Prasad built up an active school of research on summability theory at the University of Allahabad.

Died 18 January 1966.

PRASAD, Gopal

Elected 1982

Born 31 July 1945; Ghazipur, Uttar Pradesh
Ph.D.(1974), University of Bombay

Specialization: Pure Mathematics (Lie Groups and Algebraic Groups)

Research Achievements: Prasad's contributions relate to: (i) strong rigidity of lattices in real p-adic groups; (ii) proof of the strong approximation, and (iii) computation of the covolume of S-arithmetic groups. With M.S. Raghunathan, Prasad determined the rank of semi-simple groups from the structure of a lattice, and computed the congruence kernel and the second cohomology of semi-simple groups, and worked with A.Borel on the Knesor- Tits problem. He has worked on finiteness theorems for S-arithmetic groups, and with Allen Moy, on the existence of minimal K-types for p-adic groups .

Positions: Professor, Department of Mathematics, University of Michigan, USA (currently); Professor, Tata Institute of Fundamental Research, Bombay (1984-92).

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: Narusingha Rao Medal (Indian Mathematical Society) (1973); Shanti Swarup Bhatnagar Prize (1989); Invited Address at the, University of Michigan (1989) International Congress of Mathematicians, Kyoto (1990); and University of Paris (1991)

Address: Professor, Department of Mathematics, University of Michigan, Ann Arbor MI 48109 USA; Tel: (313) 764-0372; Fax:(313) 763-0937; E-mail: gprasad @ math.lsa.umich.edu; Tel: (313) 761-8470 (Res).

PRASAD, Malur Ramaswamy-Iyengar Narasimha *Elected 1970*

Born 1 May 1923
Ph.D., Universities of Mysore and Wisconsin (USA)

Specialization: Endocrinology and Physiology of Reproduction

Research Achievements: Prasad's researches in epidymal physiology and male reproduction led to the discovery of a method of regulation of male fertility. Multicentred clinical trials were carried out by the World Health Organization based on this finding. He has also worked on the mechanism of astrogen- antiastrogen interaction and comparative endocrinology.

Positions: Lecturer in Zoology, Central College, Bangalore; Professor of Zoology, University of Delhi (till 1977); Scientist, Special Programme in Human Reproduction, WHO, Geneva (till 1983).

Learned Society: Fellow, Indian Academy of Sciences; Member, International Society of Andrology, and Society for the Study of Fertility; Vice-President, International Society for Research in Biology of Reproduction; Vice-President, INSA (1975-76).

Awards and Honours: FICCI Award (1972); Jagdish Chandra Bose Award (1976); National Family Planning Award. Hony Captain National Cadet Corps

Lectureships: Dr Shantha Rao Memorial Oration (1983).

Author/Editor Facet: Served as Editor of Publications, INSA (1971-74).

Policy-making Bodies: Chairman, Biology Research Division, Central Family Planning Institute, Delhi; Member, Research Committee and Orals Advisory Group, International Planned Parenthood Federation; and Anatomy Group, ICMR.

INSA has instituted 'Professor M.R.N. Prasad Memorial Lecture Award'.

Died 7 October 1987.

PRASAD, Phoolan

Elected 1987

Born 1 January 1944; Khejuri, Uttar Pradesh
Ph.D. (1968), Indian Institute of Science (IISc), Bangalore

Specialization: Nonlinear Wave Propagation and Partial Differential Equations, Theoretical Fluid Mechanics

Research Achievements: Prasad has worked on hyperbolic systems of quasilinear partial differential equations and his results have led to a deeper understanding of many physical phenomenon such as transonic flows, caustics, waves at the interface of a clear liquid and a mixture in a sedimentation process. Nonlinear ray theory and shock ray theory are some of his finest works.

Positions: Professor, Department of Mathematics, IISc, Bangalore.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1983).

Author/Editor Facet: Contributed five books: 'Nonlinear Waves in One-Dimensional Dispersive Systems' (OUP, 1979), 'Partial Differential Equations' (Wiley Eastern, 1985; John Wiley Sons, 1985), 'Propagation of a Curved shock and Nonlinear Ray Theory' (Longman Higher Education, 1993), ' Lectures on Different and Integral Equation' (IISc, 1978), ' Introduction to Hyperbolic Partial Differential Equations and Nonlinear Waves' (IISc, 1977); Member, editorial boards of: *Indian J. Pure Appl. Math., Proc. Indian Acad. Sci. (Math. Sci.), J. Ramanujan Math. Soc.*, etc.

Policy-making Bodies: Member, National Board for Higher Mathematics (1986-).

Other Contributions: Prasad has played an important role in organizing instructional courses for university teachers and research workers, in formulating some national programmes for raising the level of mathematics education, and in making the Indian National Mathematical Olympiad and the training campus for International Mathematical Olympiad successful.

Address: Professor, Department of Mathematics, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2265); Telex: 845-8349 IISc IN; Fax: 91-80-341683; E- mail: prasad@math.iisc.ernet.in; Res: 927-928, 7th Cross, HMT Layout, Mathikere P.O., Bangalore 560 054; Tel: (080) 360039.

PRASAD, Rajendra

Elected 1990

Born 1 January 1936; Haiderabad, Uttar Pradesh
Ph.D. (1961), Mississippi State University,USA

Specialization: Agronomy, Soil Fertility, Fertilizer Use Research

Research Achievements: Prasad has conducted research on the efficiency of nitrogen use with special reference to nitrification inhibitors and slow-release nitrogenous fertilizers. He is credited with the discovery of neem cake- coated urea which gives 15-20 per cent higher efficiency than prilled urea; it has been well accepted by farmers.

Positions: Professor of Agronomy, and Head, Division of Agronomy, Indian Agricultural Research Institute, New Delhi.

Learned and Professional Societies: Fellow, National Academy of Sciences (India), National Academy of Agricultural Sciences (India), and Indian Society of Agronomy.

Awards and Honours: Hooker Award (IARI); Rafi Ahmed Kidwai Memorial Prize (ICAR), Silver Jubilee Award (Fertilizer Association of India).

Author/Editor Facet: Member, editorial board, *J. Agron. Crop Sci. Zeitschrift fur Acker-und Pflanzenbau* compiled and edited 'Low-Cost Crop Production Technology for Farmers' (IFFCO and Ministry of Agriculture).

Address: Head, Division of Agronomy, Indian Agricultural Research Institute, New Delhi 110 012; Tel: (011) 5785776; Fax: 91-011- 5740722/5752006; Res: B-10, IARI Campus, New Delhi 110 012; Tel: (011) 5737957.

PRASAD, Yellapregada V.R.K.

Elected 1990

Born 21 May 1944; T.K. Palem, Andhra Pradesh
Ph.D. (1971),Indian Institute of Science (IISc), Bangalore

Specialization: Metallurgy

Research Achievements: Prasad has developed a model that forms a missing link between continuum mechanics and atomistic approaches to the modelling of materials flow in net-shape making processes. Called dynamic materials model, it has found applications in processing very complex high- tech materials like metal-matrix composites with whiskers, high-temperature alloys from powders and rapidly solidified P/M materials, without recourse to trial-and-error methods. The processing science research, Prasad is pursuing, is expected to have a significant impact on future engineering ceramics and polymer technology.

Positions: Professor and Chairman (Currently),Associate Professor (1981-84), Assistant Professor (1973-81), Department of Metallurgy, IISc, Bangalore; Adjunct Professor, College of Engineering, Wright State University,(1985).

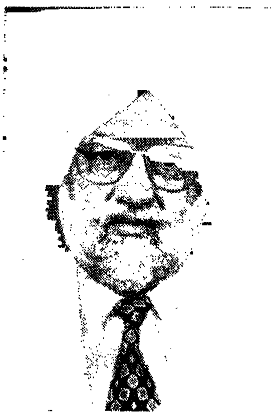
Learned and Professional Societies: Member, Indian Institute of Metals; Associate Member, Electrochemical Society of India.

Awards and Honours: National Metallurgist's Day Award (1982); Indranil Award and Gold Medal (Mining, Geological and Metallurgical Institute of India) (1981-82); Binani Gold Medal (Indian Institute of Metals).

Address: Professor, Department of Metallurgy, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411/2259; Res: B/2, Hospital Extension, Hebbal, Bangalore 560 024; Tel: (080) 330 673.

PRIHAR, Sohan Singh

Elected 1984



Born 15 July 1932; Jalandhar, Punjab
Ph.D. (1965), Ohio State University, USA

Specialization: Soil Physics, Water Management

Research Achievements: Prihar has elaborated the process of evaporation from soil and reconciled the controversy on the role of tillage-induced soil mulch in moisture conservation. He has also given a simple weather-based (new) approach for scheduling irrigations to crops; the new schedules have saved water without reducing yields. Also developed improved crop production technology to enhance yields under water stress and to obtain higher efficiencies of inputs, i.e. water, nutrients and energy. His work has added to our knowledge on (i) miscible displacement of solutes with water and (ii) rational fertilizer rates for crops in relation to water supply.

Positions: Director, Pepsi Agro Food Processing Research Institute, Zahura, Punjab (1990-); Professor, Soil Physics (1971-90), Head, Department of Soils, (1977-79, 1983-87), Punjab Agriculture University, Ludhiana; Visiting Professor, Rajendra Agricultural University of Hyderabad (1976-77).

Learned and Professional Societies: Fellow, American Society of Agronomy, Indian Society of Soil Science, and National Academy of Agricultural Sciences (India).

Awards and Honours: Invention Promotion Board Award (1971); Rafi Ahmed Kidwai Memorial Prize (1973); Silver Jubilee Award (Fertilizer Association of India) (1980); ICAR Team Award (1986); *Krishak Bharati Barani Kheti* (Dryland Agriculture) Award (1987); Shri Om Prakash Bhasin Award (1989).

Author/Editor Facet: Co-authored two books: 'Irrigation of Field Crops-Principles and Practices' (ICAR) and 'Water Resources of Punjab-Critical Concern for its Agriculture' (PAU, Ludhiana) and edited four proceedings/reviews.

Policy-making Bodies: Chairman, Commission I, International Soil Science Society (1982-86).

Other Contributions: Helped Bangladesh Agricultural Research Council in planning research on soil physical conditions and water management.

Address: 136- D, Kichloo Nagar, Ludhiana 141 004; Tel: (0161) 50134.

PRUTHI, Hem Singh

Foundation Fellow

Born 23 February 1897; Deska, Pakistan
Ph.D (1925), Sc.D. *(h.c.)*, University of Cambridge, UK

Specialization: Entomology

Research Achievements: Pruthi's researches encompassed: (i) economic entomology, (ii) biological control of insect pests, (iii) termite research and control,(iv) pests of wheat, (v) damage potential of insects in sugarcane,(vi) pests of fruits and fruit trees, (vii) pests of oilseeds (cotton), (viii) taxonomic studies on homopterous group of insects, (ix) storage pests, and (x) desert locust control. His studies pointed to the thrust areas of the entomological problems of India and abroad.

Positions: Assistant Professor, Agriculture College, Lyallpur; Officer-in-Charge, Entomology Division, Indian Museum, Calcutta (1925-34); Imperial Entomologist, Indian Agricultural Research Institute, Bihar and New Delhi (1934 and 1936-43) and Director, IARI, New Delhi (1944-45); Plant Protection Adviser, Government of India (1945) and Ex-officio Director, Plant Protection and Quarantine Organization (now the Directorate of Plant Protection) and Director, Locust Control (1946-53); Professor of Entomology, Panjab University, Hoshiarpur (1954-69)

Learned and Professional Societies: Fellow, Entomological Society of India (President, 1940, 1948-50); Member, Council (1945-56, 1953-54, 1956) and Secretary (1947-52), INSA.

Awards and Honours: OBE; President, Zoology Section, Indian Science Congress (1940).

Author/Editor Facet: Authored, 'Textbook of Agricultural Entomology' (ICAR); Served as chief editor of *Indian J. Entomol.*

Other Contributions: Pruthi was responsible for organizing several entomological establishments of the Government of India.

Died 23 December 1969.

PURKAYASTHA, Rabindra Prasad

Elected 1993

Born 31 August 1935; Ilashpur, Bangladesh
Ph.D. (1965), University of London, UK

Specialization: Mycology, Plant Pathology, Phytoimmunology

Research Achievements: Purkayastha demonstrated the involvement of phytoalexins in differential resistance, basic antigenic compatibility factors in host-parasite relationships, and induced resistance in plants. He has done pioneering work on the application of immunoserological technology for determining the basic compatibility factor in legume hosts and their parasites. Also made significant contributions to mushroom science.

Positions: Professor and Head, Department of Botany, University of Calcutta, Calcutta.

Learned and Professional Societies: Fellow, Indian Phytopathological Society, Indian Mycological Society (President, 1987-90) and Indian Botanical Society (Vice- President,1993); Foundation Fellow, West Bengal Academy of Science and Technology.

Awards and Honours: President, Botany Section, Indian Science Congress (1989); Paul Johannes Bruhl Memorial Medal (Asiatic Society) (1992).

Author/Editor Facet: Has served on editorial boards of seven journals and authored/edited five books.

Policy-making Bodies: Member, Governing Body, Institute of wetland management and Ecological Design (DST and Non Conventional Energy sources, Government of West Bengal) and on scientific Panels of ICAR, New Delhi.

Address: Department of Botany, University of Calcutta, 35, Ballygunge Circular Road, Calcutta 700 032; Tel: (033) 4753681; Res: 57B/1A P.G.H. Shah Road, Calcutta 700 032; Tel: (033) 726988.

PURI, Balwant Rai

Elected 1977

Born 6 February 1909; Gujrat, Pakistan
Ph.D. (1940), University of Panjab, Lahore

Specailization: Physical Chemistry and Surface Chemistry

Research Achievements: Puri did significant research on the properties of capillary condensates, surface chemistry of carbons, catalytic reactions of industrial and environmental interest, and physico-chemical behaviour of proteins.

Positions: Reader in Physical Chemistry (1952-62), Professor in Physical Chemistry (1962-74), Professor in UGC 'Retired Teachers' Scheme (1974-77), Hony Professor (1977-79), all at Panjab University; Research Director, India Carbon Ltd. (1981-83).

Learned and Professional Societies: Fellow, Royal Institute of Chemistry, (London) and Indian Chemical Society; Member, American Carbon Society and Founder President, Indian Carbon Society.

Author/Editor Facet: Puri contributed many chapters to standard works; his chapter "Surface Complexes on Carbon" in 'Chemistry and Physics of Carbon' (Marcel Dekker, 1970) is considered by peers as authoritative.

Died 12 December 1983.

PURI, Vishwambhar

Elected 1957

Born 10 December 1909; Nagina, Uttar Pradesh
D.Sc. (1940), Agra University

Specialization: Floral Morphology, Taxonomy, Evolution

Research Achievements: Puri studied floral anatomy of Rhoeadales and Parietales; offered a new interpretation of crucifer gynoecium and clarified placentation in Cucurbitaceae and other families; offered a new interpretation of *Marsilea* sporocarp; and discussed the morphology of inferior ovary. Published two exhaustive reviews in *Botanical Reviews*. His more recent studies on evolution suggested that monocots and dicots are more independent than is usually believed.

Positions: Professor Emeritus (1975-), Hony Director, Institute of Advanced Studies (1974-75), Senior Professor and Head, Botany Department (1969-72), all at Meerut University; Principal, Meerut College, Meerut (1965-69).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), and Indian Botanical Society; Member, INSA Council (1977-79).

Awards and Honours: Birbal Sahni Medal (1964); K.N. Bahl Medal (1988); Elected Hony Vice-President, XII International Botanical Congress, Leningrad (1975); Professor Panchanan Maheshwari Memorial Lecture Award (INSA) (1990).

Lectureships: Silver Jubilee Lecture (Birbal Sahni Institute of Palaeobotany) (1977).

Author/Editor Facet: (1969-79). Prepared 'History of Botany (Floral Anatomy) for India, Burma and Ceylon', at the invitation of Indian Botanical Society; Served as editor, *J. Indian Bot. Soc.* (1969-79)

The Indian Botanical Society has instituted a medal in his honour, awarded annually since 1981.

Address: Botany Department, Meerut University, Meerut; Tel: (0121) 75021/19; Res: 13, Tilak Road, Meerut 250 001; Tel: (0121) 543455.

QASIM, Syed Zahoor

Elected 1977

Born 31 December 1926; Allahabad, Uttar Pradesh
Ph.D. (1956), D.Sc. (1968), University of Wales; D.Sc. (*h.c.*) Andhra University and University of North Bengal

Specialization: Marine Biology and Oceanography

Research Achievements: Qasim promoted ocean research in its totality in India and was responsible for building up the infrastructure and facilities for marine and Antarctic research. Polar research was non-existent in India till he initiated the work and today there are 30 institutions in the country working on the data, samples and materials collected from Antarctica. Qasim was the first to indicate the potential role of aquaculture, and the first in promoting the technology of cultured pearls. Led the first expedition to explore deep sea polymetallic nodules in the Indian Ocean and the first expedition to Antarctica.

Positions: Member, Planning Commission (1991-); Vice- Chancellor, Jamia Millia Islamia Central University (1989- 91); Secretary, Department of Ocean Development (1982-88); Secretary, Ministry of Environment, Forests & Wildlife (1981- 82); Director, National Institute of Oceanography (1974-81); Hony Professor at Madurai Kamaraj University, Indian Institute of Technology, (Madras), Annamalai University, Aligarh Muslim University and Jamia Millia Islamia University.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Maharashtra Academy of Sciences, and Bihar Academy of Sciences; Life Member, Marine Biological Association of the United Kingdom and Marine Biological Association of India; Vice-President, INSA (1985-86).

Awards and Honours: Rafi Ahmed Kidwai Memorial Prize (1974); Chandrakala Hora Memorial Medal (INSA) (1975); Golden Jubilee Gold Medal (Institute of Science, Bombay) (1975); Fuel Instruments and Engineers Pvt. Ltd. Award (1983); K.N. Bahl Memorial Gold Medal (Society of Biosciences) (1985); Lal Bahadur Shastri Award (1989); President, Indian Science Congress (1992- 93); Padma Shri (1974), Padma Bhushan (1982).

Author/Editor Facet: Member, editorial boards of four marine science journals; edited 'Science and Quality of Life'.

Policy-making Bodies: Chairman: Working Committee on Training, and Mutual Assistance, Intergovernmental Oceanographic Commission of Unesco (1976-80); Vice Chairman, Advisory Committee on Marine Resources Research, FAO (1971-74).

Other Contributions: Responsible for building the NIO as well as infrastructure and facilities for marine research. Built and commissioned oceanographic research vessel *R.V. Gaveshani* in 1976. Acquired and commissioned two more highly sophisticated oceanographic research vessels for the country.

Address: Member, Planning Commission, Yojana Bhawan, New Delhi 110 001; Tel: (011) 3711953; Telex: 3161463; Fax: 91-11-3717681; E-mail.plancom; Tel: (011) 4632626 (Res).

QURESHI, Muzaffaruddin

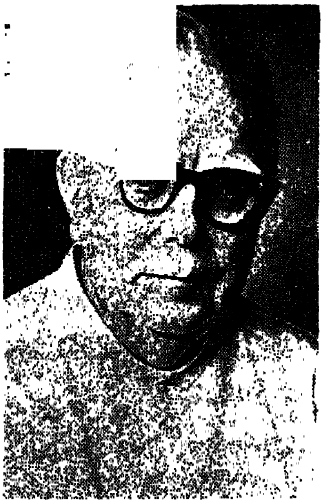
Foundation Fellow

Ph.D.

Positions: Head, Department of Chemistry, Osmania University, Hyderabad; Director, Central Laboratories for Scientific and Industrial Research (later Regional Research Laboratory, now Indian Institute of Chemical Technology), Hyderabad (1944-47).

Died (Date N.A.)

RACINE, Charles S.J. *Elected 1949*



Born 22 July 1897; Tonnay-Charente, France
D.Sc. (1934), University of Paris, France

Specialization: Mathematics, Relativity

Research Achievements: Racine's research covered mainly Riemannian spaces, theory of relativity, motion of a particle of varying mass, and relativistic problems of *n* bodies.

Positions: Professor and Head, Department of Mathematics, Loyola College, Madras.

Awards and Honours: 'Prix d' Aumale' (French Institute) (1959); Legion d'Honneur' (French Government) (1962).

Author/Editor Facet: Racine wrote a treatise 'Introduction to Potential Theory' (1942), considered to be a classic; also published a textbook on 'Modern Algebra' and another treatise on 'Mathematical Analysis' (2 vols).

Other Contributions: A French mathematician Racine made a profound impact on the teaching of mathematics in India.

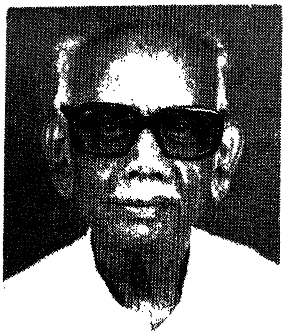
Died 8 July 1976.

RADHAKRISHNA, Bangalore Puttaiya *Elected 1973*

Born 30 April 1918; Bangalore, Karnataka
Ph.D. (1954), University of Mysore; D.Sc. (*h.c.*), Indian School of Mines, Dhanbad

Specialization: Precambrian Geology, Economic Geology, Ground Water Hydrology

Research Achievements: Radhakrishna is internationally known for his contributions to the Precambrian geology of India. Organized groundwater research in hard rocks of India and contributed to the development of groundwater resources. Instrumental in developing mineral resources of Karnataka.



Positions: Director of Mines and Geology, Government of Karnataka; Chairman, Mysore Minerals Ltd., and Chitradurga Copper Co. Ltd.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Geological Society of India (President, 1992-), Hony Fellow, Geological Society (London) and Geological Society of America.

Awards and Honours: Gold Medal (Mysore Geologists' Association) (1972); National Mineral Award; Rajyotsava Award (Government of Karnataka); D.N. Wadia Medal (INSA) (1992); Padma Shri (1991).

Author/Editor Facet: Editor *J. Geol. Soc. India* (1958-92); edited several memoirs on Indian geology.

Address: 'Sri Rama', 243/30, 5th Main Road, Chamarajpet; Bangalore 560 018; Tel: (080) 601805 (Off), (080) 603844 (Res).

RADHAKRISHNAN, A.N.

Elected 1978

Born 17 May 1927; Amurtur, Karnataka
Ph.D. (1956), University of Bombay

Specialization: Biochemistry

Research Achievements: Radhakrishnan made very significant contributions in unravelling amino acid metabolism, particularly the biosynthesis of branched-chain amino acids. His studies on intestinal transport with particular reference to amino acids, carbohydrates and vitamin B_{12} as well as unusual amino acids and peptides from plants received high peer recognition. He isolated and characterized amino compounds from *Santalum album* Linn., which include allohydroxy-L-proline, cis-4-hydroxy-L-proline and others. In biomedical research his work covered, lactase deficiency in India, amino acid metabolism in kwashiorkor, leprosy, malabsorption syndrome, mechanisms of enzyme action, genetic metabolic errors and intestinal transport.

Positions: Head, Biochemistry, Wellcome Research Unit, Christian Medical College Hospital, Vellore (1962-77); Dean (1977-80) and Professor, School of Life Sciences, University of Hyderabad (1981).

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Member, Biochemical Society (London), New York Academy of Sciences, Society of Biological Chemists, India (President, 1973-74).

Awards and Honours: First Sreenivasaya Memorial Award and Oration (Society of Biological Chemists, India) (1972); Hari Om Ashram Alembic Research Award (1977); Honour and Scroll for outstanding contributions (Society of Biological Chemists, India) (1980); Bires Chandra Guha Memorial Lecture Award INSA (1981); J.C. Bose Award (UGC) (1981).

Lectureships: Golden Jubilee Lecture Oration (Society of Biological Chemists, India) (1980).

Author/Editor Facet: Served on editorial board of *Indian J. Biochem. Biophys.*

Other Contributions: Addressed the problem of improving the quality and content of teaching biochemical sciences in universities.

Died 17 June 1990.

RAGHAVAN, Srinivasacharya

Elected 1978

Born 11 April 1934; Thillaisthanam, Tamil Nadu
Ph.D (1960), University of Bombay

Specialization: Number Theory and Automorphic Functions

Research Achievements: Raghavan has made significant contributions to arithmetical aspects of Siegel forms and integral representation by quadratic forms, to questions involving the density of orbits of irrational euclidean frames under discrete groups, and to the structure of singular modular forms.

Positions: Professor (1975-90), School of Mathematics, and Dean (1986-89), Tata Institute of Fundamental Research, Bombay; Visiting Professor, Ramanujan Institute for Advanced Studies in Mathematics, Madras (1972), and SPIC Science Foundation, Madras.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Maharashtra Academy of Sciences; Member, Indian Mathematical Society; Member, INSA Council (1981-83).

Awards and Honours: UGC National Lecturer (1974); Shanti Swarup Bhatnagar Prize (1979).

Author/Editor Facet: Authored/co-authored five books, which include 'Homological Methods in Commutative Algebra' (TIFR, 1971) and 'Projective Geometry' (University of Bombay, 1972); member, editorial board, *J. Indian Math. Soc., Indian J. Pure Appl. Math.,* and *Proc. Indian Acad. Sci.*

Address: School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152971 (Ext 247); Res: 19, Abhiramapuram, First Street, Madras 600 018; Tel: (044) 457533.

RAGHAVARAO, Ravipati

Elected 1990

Born 15 July 1929; Pothavaram, Andhra Pradesh
D.Sc. (1960), Andhra University, Waltair

Specialization: Atmospheric Physics-Dynamics and Electrodynamics of Upper Atmosphere

Research Achievements: Raghavarao's work has provided mechanisms for some of the enigmatic problems in the equatorial ionosphere and thermosphere; for example (i) why and how an ionization layer, known as 'Ledge' is formed in the topside ionosphere (height region, 500-1000 km); and (ii) the daytime reversal of the electrojet. He detected vertical winds in the 100-300 km height region by rocket-borne experiments and in the 300-450 km height region by data obtained from satellite- borne (DE-2) instrument. Offered a theoretical explanation of the occurrence and its variability of post-sunset spread-F (plasma instability) by vertical winds in the ambient gas. Discovered an anomalous distribution of gas temperature and zonal winds (ETWA) in thermosphere. Produced evidence to show ETWA as a source of vertical winds.

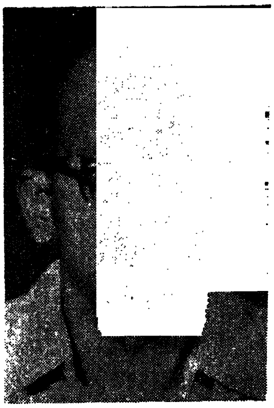
Positions: Hony Professor, Senior Professor, Physical Research Laboratory, Ahmedabad; Senior Research Associate, National Research Council, USA.

Policy-making Bodies: Chairman, INSA Committee for SCOSTEP (INSCOSTEP) (1989-91); Member, IAGA-Commission on Electrodynamics--Middle Atmosphere, National Steering Committee for World Ionosphere-Thermosphere Study (WITS), INSCOSTEP, Monitoring and Review Committee of the MST Radar (in India), Interdivisional Commission for developing countries of IAGA (1977-91); Chairman, Working Group on Atmospheric Structure and Dynamics, IMAP-C (until 1989); and several other groups/programmes.

Address: Hony Professor, Physical Research Laboratory, Navrangpura, Ahmedabad 380 009; Tel: (0272) 462129 (Ext 4762); Telex: 0121-6397; Fax: 91-272-460502; E- mail: raghavarao@prl.ernet.in; Res: 394, Saraswati Nagar, Near Himatlal Park, Ahmedabad 380 015; Tel: (0272) 640040.

RAGHUNATHAN, Madabusi Santanam

Elected 1975



Born 11 August 1941; Anantapur, Andhra Pradesh
Ph.D.(1966), University of Bombay

Specialization: Lie Groups and Algebraic Groups

Research Achievements: Raghunathan's significant research achievements are in the fields of congruence subgroup problem and second cohomology of groups over local fields. He proved the rigidity of arithmetic subgroups in the higher dimensional case using both algebraic and differential geometric techniques. With H. Garland, he constructed fundamental domains for lattices in rank one and Lie groups.

Positions: Senior Professor, School of Mathematics, Tata Institute of Fundamental Research, Bombay.

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Indian Academy of Sciences and Maharashtra Academy of Sciences; Member, Indian Mathematical Society; Member, INSA Council (1984-86).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1978); S. Ramanujan Medal (INSA) (1991).

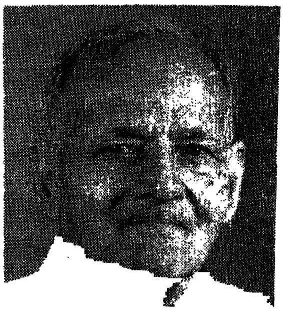
Author/Editor Facet: Authored a book titled 'Discrete Subgroups of Lie Groups' (Springer-Verlag 1972).

Address: Senior Professor, School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152311, 2152971; Res: 601, Meghnad, TIFR Housing Colony, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152466.

RAIZADA, Mukat Behari

Elected 1953

Born 2 July 1907; Pilakhana, Uttar Pradesh
M.Sc. (1929), University of Allahabad



Specialization: Botany

Research Achievements: Raizada specialized in taxonomy and nomenclature of higher plants. Did extensive work on systematics, taxonomy and nomenclature, which added to our knowledge of the flora of Upper Gangetic Plains, Bihar and Orissa.

Positions: Chief Research Officer and Head, Division of Botany, Professor Emeritus, Forest Research Institute and Colleges, Dehra Dun; Principal, D.A.V. College, Dehra Dun.

Learned and Professional Societies: Life Member, Indian Botanical Society.

Awards and Honours: XII International Botanical Congress Medal (Leningrad); Golden Jubilee Gold Medal (Forest Research Institute and Colleges, Dehra Dun).

Author/Editor Facet: Raizada authored many books which include 'Beautiful Indian Climbers and Shrubs', 'Grasses of Upper Gangetic Plains', 'Living Indian Gymnosperms', 'Flora of Gir Forest', 'Flora of Mussoorie', 'Flora of Andhra', 'Essentials of Forest Botany 'and 'Trees for Van Mahotsav'.

Died 18 November 1992.

RAJNATH

Elected 1943

Born 8 August 1904; Uttar Pradesh
Ph.D. (1930), University of London, UK

Specialization: Economic Geology, Hydrogeology

Research Achievements: Rajnath's studies, besides palaeontology and stratigraphy, spread over structural geology, petrology, economic geology (including industrial aspects), engineering geology and hydrogeology. His work on the Jurassic rocks of Kutch is a significant contribution to the geology of India. He postulated the existence of Pleistocene beds in the form of at least two big anticlines beneath the Indo-Gangetic alluvium, which run parallel to, and on the south of the Himalayas. Conical ring structures in Fawn limestone in Mirzapur district, according to him, are of inorganic origin. To counter floods in major north Indian rivers, he suggested many measures, one of them being the construction of a trans-Deccan canal joining the Bay of Bengal and Gulf of Kutch, to serve as an exit for water of flooded rivers. Rajnath worked out the geology of the occurrence of Shilajit, a well-known Ayurvedic tonic. White sandstone of Krol formation in Bilaspur state, he found, was a useful material for the manufacture of glass.

Positions: Professor and Head, Department of Geology (1936- 60) and Principal (1960-67), College of Science, UGC Professor (1968- 70), Banaras Hindu University, Varanasi.

Learned and Professional Societies: Founder President, Palaeontological Society of India; Fellow, Geological Society of London.

Awards and Honours: President, Geology Section, Indian Science Congress (1942).

Author/Editor Facet: Member, editorial board of *J.Ayurveda.*

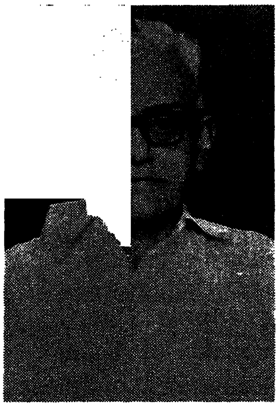
Other Contributions: Rajnath's role in the promotion of geological education and industrial development of the country was noteworthy.

Died 6 August 1972.

RAJAGOPAL, Cadambathur Tiruvenkatacharlu *Elected 1964*

Born 8 September 1903; Madras, Tamil Nadu
B.A.(1925), University of Madras

Specialization: Mathematics



Research Achievements: Rajagopal worked on (i) sequences, series, and summability; (ii) functions of a complex variable; and (iii) history of medieval Kerala mathematics. About a dozen of his papers related to the generalization and/or unification of several tests for convergence for series of positive terms without explicit connection with summability. These provided an undercurrent for the theme of generalization and unification of Tauberium theorems. Also provided satisfactory modern forms of the proofs of the series: (Gregory's power series for arc *tan x*, A.D. 1671; Newton's power series for *sin x, cos x*, A.D. 1670) carefully moulding the proof, upon their originals in *Yuktibhasa*, a work in Sanskritized form of Malayalam based on an early sixteenth century text *Tantrasangraha*. The series of sine and cosine, thus appears in Indian works in *Yuktibhasa.*

Positions: Professor, Department of Mathematics, Christian College, Madras; Professor and Director, Ramanujan Institute for Advanced Studies in Mathematics, University of Madras.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Member, Indian Mathematical Society (Hony Librarian, President) and London Mathematical Society.

Awards and Honours: President, Mathematics Section, Indian Science Congress (1963).

Other Contributions: Rajagopal strove hard to establish the Ramanujan Institute as a leading centre of mathematical research in India.

Died 25 April 1978.

RAJA GOPAL, Erode Subramanian

Elected 1981

Born 12 May 1936; Salem Town, Tamil Nadu
Ph.D. (1961), Indian Institute of Sciences (IISc), Bangalore

Specialization: Condensed Matter Physics

Research Achievements: Raja Gopal's work has shown the breakdown of rectilinear diameter law near the critical temperature in phase transition phenomena. He has evaluated all the 21 elastic constants of the first triclinic crystal copper sulphate pentahydrate. Observed rigidity - percolation thresholds in amorphous chalcogenide glasses at high pressures and low temperatures.

Positions: Director, National Physical Laboratory, New Delhi (1991-); Dean, Faculty of Science, Chairman, Regional Instrumentation Centre, Chairman, Department of Physics, Professor of Physics, all at IISc, Bangalore (1969-91).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Institute of Physics (UK), Indian Cryogenic Council (sometime President) and Acoustical Society of India (President).

Awards and Honours: UGC National Lecturer (1973-74); Shanti Swarup Bhatnagar Prize (1978); Sir C.V. Raman Award (1979- 80); Invention Award (NRDC) (1984).

Lectureships: Golden Jubilee Lecture (Indian Science Congress) (1992); Biren Choudhury Lecture (University of Delhi) (1992).

Author/Editor Facet: Authored 3 books; edited 2 books; editor, *Pramana* (1983-88) and *J. Acous. Soc. India* (1981- 89); member, editorial boards of: *Pramana* (1975-88) and *J. Instrum. Soc. India.*

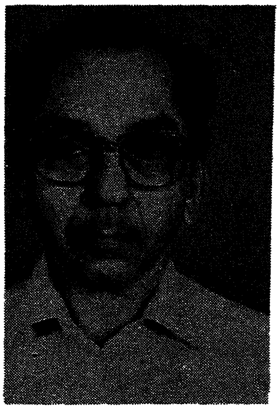
Other Contributions: Assisted UGC, CSIR, DAE, DST, DRDO etc. in various review/advisory committees.

Address: Director, National Physical Laboratory, New Delhi 110 012; Tel: (011) 5741440; Fax: 91-11-5752678; Telex: 031-77099 NPL IN, 031-77384 SD IN; E-mail: npl!csird- ernet.in; Res: Director's Banglow, National Physical Laboratory Campus, New Delhi 110 012; Tel: (011) 5732023.

RAJAPPA, Srinivasachari

Elected 1985

Born 22 February 1934; Madras, Tamil Nadu
Ph.D. (1958), University of Madras



Specialization: Organic Chemistry

Research Achievements: To Rajappa's credit stand:. (i) synthesis of cyclodipeptide monoimino ethers and using them as novel chiral synthons, (ii) a novel synthesis of thiophenes and thiazoles; (iii) synthesis and structural studies on push-pull systems, especially nitroenamines, (iv) discovery of a versatile synthesis of nitroacetamides and the elusive nitrothioacetamides from nitroenamines, (v) use of nitroacetyl group as a novel peptide synthon, (vi) new synthetic strategies for carbamates and thiocarbamates, including a viable non-MIC route to carbamate pesticides, and (vii) the first demonstration of the existence of non-bonded attractive interactions involving sulphur in the solution phase.

Positions: Manager and Head of Chemistry Research, Hindustan Ciba-Geigy Ltd., Bombay; Head, Division of Organic Chemistry, National Chemical Laboratory, Pune.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, and Maharashtra Academy of Sciences.

Awards and Honours: K.G. Naik Gold Medal (M.S. University of Baroda).

Lectureships: Professor K. Venkataraman Lecture (University Department of Chemical Technology, Bombay); R.C. Shah Lecture (University of Bombay); G.P. Kane Lecture (ICMA).

Author/Editor Facet: Contributed two chapters to 'Advances in Heterocyclic Chemistry' (1979, 1993), and one to 'Comprehensive Heterocyclic Chemistry'.

Address: Head, Division of Organic Chemistry (Synthetic), National Chemical Laboratory, Pune 411 008; Tel: (0212) 335153; Telex: 0145-266; Fax: 91-212-330233; Res: B-5, NCL Colony, Pashan Road, Pune 411 008; Tel: (0212) 336320.

RAJARAMAN, Ramamurti

Elected 1985

Born 11 March 1939; Coimbatore, Tamil Nadu
Ph.D. (1963), University of Cornell, USA

Specialization: Theoretical Physics

Research Achievements: Rajaraman's contributions relate to: three-body theory in nuclear matter; particle physics phenomenology and electroproduction; theory of charged quantum solitons; methods for finding new solitons; first quantization of anomalous gauge theory; proof of absence of topological anomaly, and clarification of fractional charge in polyacetylene.

Positions: Professor, Centre for Theoretical Studies (1976-), MSIL Chair (1991-), Indian Institute of Science, Bangalore; Reader, University of Delhi (1969-76); Faculty Member, Institute for Advanced Study, Princeton, USA (1967- 69); Assistant Professor, University of Southern California, USA (1965-67); Visiting Professorships in Massachusetts Institute of Technology, Harvard (1984-85), Stanford (1985) and Illinois (1992-93) universities.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1983); G.P. Chatterjee Memorial Lecture Award (INSA) (1989).

Author/Editor Facet: Authored 'Introduction to Solitons and Instantons in Quantum Field Theory' (North-Holland, 1982) and a monograph 'Some Non-Perturbative Semi-classical Methods in Quantum Field Theory'; editor, *Pramana* (1989-92); member of editorial board of *Int. J. Mod. Phys.* (1986-88).

Address: Professor, Centre for Theoretical Studies, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2474, 2266); Res: 57/2, 17A Cross, 8th Main, Malleswaram, Bangalore 560 055; Tel: (080) 348505.

RAJARAMAN, Vaidyeswaran *Elected 1982*

Born 8 September 1933; Erode, Tamil Nadu
Ph.D. (1961), University of Wisconsin, USA

Specialization: Computer Science

Research Achievements: Rajaraman's research work spans diverse areas of computer science: software design, hardware design and applications of computers. His significant contributions include: formulation of data-flow-oriented specification methods for information systems, new algorithms for logical error detection in decision table programs and in microcomputer applications in real-time control. He designed and developed hardware and software for inexpensive parallel computers.

Positions: Professor, Supercomputer Education and Research Centre and Chairman, Indian Institute of Science, Bangalore (1982-); Professor of Electrical Engineering and Computer Science, Indian Institute of Technology, Kanpur (1963-82).

Learned and Professional Societies: Fellow, Indian National Academy of Engineering, Computer Society of India, Institution of Engineers (India), Indian Academy of Science, Institute of Electronics and Telecommunication Engineers (India); Member, INSA Council (1986-88).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1976); Homi Bhabha Award (UGC) (1982); Uttar Pradesh Government National Award (1988).

Author/Editor Facet: Written textbooks on computer programming, analog computation and other topics; member, editorial boards of: *Edu. & Comput. Sadhana, Comput. Soc. India J.* and *Instn. Telecom. Engrs. J.*

Other Contributions: Rajaraman has pioneered computer science education and curriculum development in India.

Address: Professor and Chairman, Supercomputer Education and Research Centre, Indian Institute of Science, Bangalore, 560 012; Tel:(080) 346653, 346086; Fax: 91-80-346648; Res: Duplex Quarters, 20 IISc Campus, Bangalore 560 012; Tel: (080) 344080.

RAJASEKARAN, Guruswamy *Elected 1986*

Born 21 February 1936
Ph.D.(1965), University of Chicago, USA

Specialization: Quantum Field Theory, High Energy Physics

Research Achievements: Rajasekaran has worked on: shadow poles, K-pole test for elementarity, fixed pole in Compton scattering, gauge theory, neutral current, and integrally charged quarks. In collaboration with R.H. Dalitz, he showed that a multichannel resonance pole, in general, is followed by a retinue of poles on the various Rieman sheets (of the complex energy plane). The discovery of shadow poles answered a serious objection raised by R.J. Oakes and C.N. Yang against the (flavour) SU(3) symmetry and paved the way for the eventual success of SU(3). Formulated an empirical test for elementarity or compositeness of hadrons. With Rajaraman, he discovered the existence of a fixed pole in the virtual Compton scattering amplitude.

Positions: Joint Director, Institute of Mathematical Sciences, Madras, and Hony Professor, Department of Theoretical Physics, University of Madras; Visiting Professor, National Laboratory for High Energy Physics, Japan (1980-82), University of Texas (1974), University of Hawaii (1974), University of Oxford (1963- 64), and University of Chicago (1961-63).

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Address: Joint Director, Institute of Mathematical Sciences, CPT Campus, Madras 600 013; Tel: (044) 2351856; Res: 15, XI Cross Street, Indira Nagar, Madras 600 020; Tel: (044) 413395.

RAJASEKARASETTY, Madhavasetty Ramalingam *Elected 1978*

Born 16 October 1919; Bangarapet, Karnataka
Ph.D. (1952), University of Columbia, USA

Specialization: Genetics, Cytogenetics, Evolution

Research Achievements: Rajasekarasetty's researches covered: population genetics, radiation cytology and effect of physical and chemical agents on germ-line cells. He hypothesized that karyotypic stability is necessary for species identity, and absolute stability culminates in an evolutionary cul-de-sac. The delineation of the types of anomalies, their quanta and probable significance in terms of (i) chromosome garniture, (ii) impeding the consummation of meiosis, (iii) abortive attempts to establish themselves in natural populations, and (iv) successful maintenance of karyological innovations (which natural selection seems to prefer) have given an insight into the dynamics of karyotypic evolution in natural populations. His work, qualitative as well as quantitative on X-ray-induced meiotic chromosomal aberrations paved the way for a better understanding of chromosome structure, mechanisms involved in the production of various anomalies, dose-yield and time-yield relationships of aberrations and inter-relationships of these aberrations.

Positions: Senior Professor and Head, Department of Post- Graduate Studies and Research in Zoology, University of Mysore, Mysore.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India); Member, INSA Council (1981-82).

Other Contributions: Rajasekarasetty started a school of research in animal genetics at University of Mysore.

Died 3 July 1982.

RAJU, S.P.

Elected 1948

Born 29 March 1889
Dr. Ing., University of Munich, Germany

Specialization: Hydraulics Engineering

Research Achievements: Raju's researches covered: causes and prevention of scour in causeway with pipe vents in sand foundations; flow in bends of open channels; OGEE spillway and dissipation of energy under Nizamsagar flood gates; nature of flow in arched vents of deep submersible bridges during floods; and coefficent of discharge of water in oblique and smokeless hygienic *chulas* (cooking stoves).

Positions: Engineer-Director, Engineering Research Department, Nizam's Government, Hyderabad; Professor of Hydraulics and Principal, Engineering College, Osmania University, Hyderabad,

Learned and Professional Societies: Member, Institution of Engineers (India); Chairman, Hyderabad Centre, International Association for Hydraulic Structures Research, Stockholm.

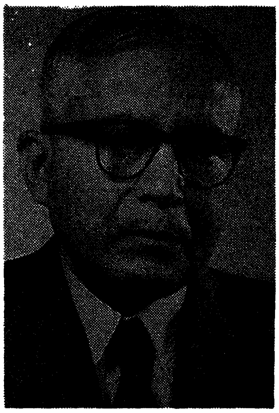
Other Contributions: Raju made noteworthy contributions to raise the quality of engineering education in Indian universities.

Died (Date N.A.).

RAKSHIT, Hrishikesh

Elected 1943

Born 8 February 1906; Serampore, West Bengal
D.Sc. (1934), University of Calcutta



Specialization: Radio Physics, Electronics

Research Achievements: Rakshit devised a novel method for measuring field strengths of echoes in ionospheric studies, and recorded wireless echoes with the same antenna for transmission and reception, which provided the basic idea for radar. Developed (i) 3-phase R-C oscillator for producing wideband FM, and (ii) a delayed-coincidence technique for (a) measuring ionospheric height, and (b) fabricating an electronic torquemeter with remote control.

Positions: Assistant Director, National Physical Laboratory (1948-49); Assistant Professor and Head, Department of Physics and Electronics Communications, Bengal Engineering College, Howrah (1949-55); Senior Professor and Head, Department of Electronics and Electrical Communication Engineering, Indian Institute of Technology, Kharagpur (1955- 56); Unesco Expert in Electronics, University of Damascus, Syria (1966-67).

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Indian Physical Society, Institute of Physics (London), and Institution of Electronics and Telecommunication Engineers (India).

Died 30 August 1991.

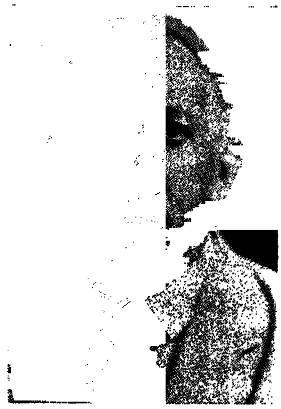
RAM BEHARI

Elected 1941

Born 25 April 1897; Delhi
Ph.D. (1932), Sc.D. (1945), University of Dublin, Ireland

Specialization: Pure and Applied Mathematics

Research Achievements: Ram Behari made important contributions to the theory of ruled surfaces and rectilinear congruences, Riemannian spaces and generalized Riemannian spaces, complex manifolds, and Einstein's Unified Field Theory. He is considered to be the father of differential geometry in India.



Positions: Professor and Head, Department of Mathematics and Statistics, University of Delhi; Founder Director, Correspondence Courses, University of Delhi; Vice-Chancellor, University of Jodhpur.

Learned and Professional Societies: President, Indian Mathematical Society (1953-56); Fellow, Indian Academy of Sciences and National Academy of Sciences (India); President, Calcutta Mathematical Society, *Bharat Ganit Parishad*, Academy for Progress of Mathematics, and Society of Mathematical Sciences; Member, INSA Council (1961-63).

Awards and Honours: Uttar Pradesh Education Minister's Gold Medal (1943); Distinguished Service Award (Mathematical Association of India) (1977); President, Mathematics Section, Indian Science Congress (once); Chairman, Differential Geometry Section, International Congress of Mathematics.

Author/Editor Facet: Authored a monograph 'Differential Geometry of Ruled Surfaces', a standard reference.

Policy-making Bodies: Member, International Commission of Mathematical Instruction (1954) and International Mathematical Union.

Died 14 December 1981.

RAM UDAR

Elected 1985

Born 1 December 1926; Basti, Uttar Pradesh
Ph.D. (1959), University of Lucknow

Specialization: Botany, Bryology

Research Achievements: Ram Udar worked on the morpho- taxonomy, palynology and life histroy, enzymology, cytology and ultrastructure of Indian Hepaticeae. He discovered two orders in Indian bryoflora, viz. Calobryales in Hepaticeae and Buxbaumiales in mosses; described a number of taxa new to science and several new records for the country. Did some significant work on Jungermannials - a group which had not been investigated adequately earlier. With regard to Indian liverworts, he pioneered the study of oilbodies which form one of the most important characters in the systematics of foliose liverworts.

Positions: Professor of Botany, University of Lucknow, Lucknow

Learned and Professional Societies: Life Member, Indian Botanical Society and Palaeobotanical Society (Vice- President); Member, American Bryologial and Lichenological Society, British Bryological and Lichenological Society; Founder-President, Indian Bryological Society.

Author/Editor Facet: Wrote 'An Introduction to Bryophyta' and 'Bryology in India'.

Other Contributions: Established a strong school of bryology in University of Lucknow.

Died 12 May 1985.

RAMA

Elected 1988

Born 16 March 1929; Nandpur Kalaur, Punjab
Ph.D. (1962), University of Bombay

Specialization: Nuclear Hydrology

Research Achievements: Rama has made significant contributions to: instrumentation in particle accelerators and investigations of interactions of primary and secondary cosmic rays; geochronology of Deccan traps using K-Ar method of dating; and use of environmental radioisotopes in problems in meteorology, hydrology and oceanography. In particular, he has (i) conceived and implemented the use of radon in delineating the circulation of Indian summer monsoon; (ii) conceived and proved the validity of the proposition of using the aquifers connected to the seasonal streams in Indo- Gangetic plains for storing the surplus flood waters of these streams; and (iii) elucidated the mechanism of emanation of radon gas from common minerals in the terrestrial rocks.

Positions: Emeritus Scientist, National Geophysical Research Institute, Hyderabad.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Author/Editor Facet: Authored 'Our Water Resources' (National Book Trust of India).

Address: Emeritus Scientist, National Geophysical Research Institute, Hyderabad 500 007; Tel: (0842) 850293; Fax: 91- 0842- 854164; Tel: (Res) (0842) 852007.

RAMA DAS, Vallabhaneni Sita *Elected 1978*

Born 5 February 1933; Gudlavalleru,
Andhra Pradesh
D.Phil. (1957), University of Oxford, UK

Specialization: Plant Sciences: Plant Physiology, Photosynthesis

Research Achievements: Rama Das's main contributions relate to (i) stomatal and non-stomatal parameters in the control of photosynthesis, and (ii) herbicide action in photosynthesis. He has also done extensive work on the analysis of photosynthesis in naturally occurring C_3/C_4 intermediates, regulation electron transport, and thylakoid membrane polypeptide composition in relation to variable light regime. Elucidated the role of chloroplast organelle in the pathway of rubber biosynthesis in guayule.

Positions: Professor, School of Life Sciences, University of Hyderabad (1989-); Director, CSIR Complex, Palampur (1991); Rector (1986-87), Dean, Faculty of Sciences (1985-88), Professor and Head of Department of Botany (1970-88), Sri Venkateswara University, Tirupati.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Andhra Pradesh Academy of Sciences (sometime past- President), and Indian Society for Plant Physiology (sometime past-President).

Awards and Honours: UGC National Lecturer (1978-79; 1985-86); FICCI Award (1978); J.J. Chinoy Medal (1978); Birbal Sahni Gold Medal (1985); Watermull Honor Summus Medal (USA) (1987).

Author/Editor Facet: Editor-in-Chief, *Indian J. Plant Physiol.* (1977-78); served on editorial board of *Indian J. Exp. Biol.*

Address: Professor, School of Life Sciences, University of Hyderabad, Hyderabad 500 134; Tel: (0842) 253901 (Ext 4545); Fax: 91-842-253145.

RAMA RAO, Alla Venkata *Elected 1986*

Born 2 April 1935; Guntur, Andhra Pradesh
Ph.D. (1964), D.Sc. (1987), University of Bombay

Specialization: Organic Chemistry, Medicinal Chemistry, Chemical Technology

Research Achievements: Rama Rao has contributed extensively to natural products chemistry and organic synthesis. He has pioneered chiral synthesis of important physiologically active compounds such as antitumour antibiotics, immunosuppressants, beta-lactam antibiotics, and macrolides. Also developed and implemented technology for a variety of life-saving drugs under sponsorship from several Indian pharmaceutical industries.

Positions: Director, Indian Institute of Chemical Technology, Hyderabad (1985-); Head, Division of Organic Chemistry, National Chemical Laboratory, Pune (1980-85).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Maharashtra Academy of Sciences and Andhra Pradesh Academy of Sciences (Council Member); Active Member, New York Academy of Sciences.

Awards and Honours: Durga Prosad Khaitan Memorial Medal (Asiatic Society) (1992); Viswakarma Medal (INSA) (1991); CSIR Technology Award (1991); Ranbaxy Research Foundation Award (1991); FICCI Award (1986); Indian Merchants Chamber Award (1986); UDCT Distinguished Alumni Medal (1985); VASVIK Award (1984); Amrut Modi Research Foundation Award (1984); K.G. Naik Gold Medal (1982); Padma Shri (1991).

Lectureships: Acharya P.C. Ray Memorial Lecture (Indian Chemical Manufacturers Association) (1993); Dr S.H. Zaheer Memorial Lecture (1992); Professor K. Venkataraman Endowment Lecture; Professor Vig Endowment Lecture (Panjab University) (1990); Dr Sukh Dev Endowment Lecture (1989); Professor M. L. Khorana Memorial Lecture (1988); C.K. Murthy Memorial Lecture (Indian Chemical Engineers Congress) (1987); Professor H.R. Sahasrabudhe Endowment Lecture (Nagpur University) (1986); Prof. A.B.Kulkarni Endowment Lecture (University of Bombay) (1983).

Author/Editor Facet: Member, board of consulting editors, *Bioorg. Med. Chem. Lett.* (1991); editorial boards of: *J. Antibiot.*, *Indian J. Chem.* (1982-) and *Indian J. Technol.* (1985-).

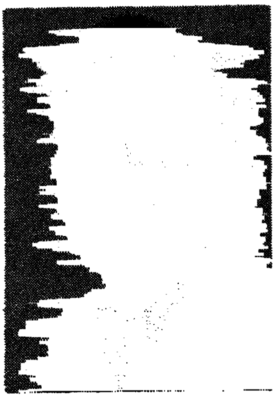
Policy-making Bodies: Member, Scientific & Technical Advisory Committee of UNDP/ World Bank/WHO Special Programme for Research and Training in Tropical Diseases (1993-); Titular Member, IUPAC Sectional Committee (Medicinal Chemistry Division) (1988-91); Member, Ad-hoc Technical Advisory Committee on CFCs Destruction Technologies of UN Environmental Protection Agency (1990-92); Chairman, Drug Technology Committee (1990-) and Scientific Advisory Committee (1990-), both of Ministry of Chemicals and Fertilizers, Government of India; Several committees of DST, CSIR, UGC, DOD; State Council for Science & Technology, Andhra Pradesh.

Other Contributions: As Director of IICT, he has given a new direction to the management of science.

Address: Director, Indian Institute of Chemical Technology, Hyderabad 500 007; Tel: (0842) 853289, 853403; Telex: 0425- 7061 IICT IN; Fax: 91-842-853387; Res: Director's Bangalow, IICT Campus, Hyderabad 500 007; Tel: (0842) 853320.

RAMACHANDRA, Kanakanahalli

Elected 1974



Born 18 August 1933; Mandya Town, Karnataka
Ph.D. (1964), University of Bombay

Specialization: Classical Analytical Number Theory

Research Achievements: Ramachandra has proved two spectacular results on $(\zeta(1 + it))^z$, where z is a complex constant, some new theorems on the zeros of $\zeta(s) - a$ and $\zeta'(s) - a$ were proved. Stability theorems have been proved for some generalised dirichlet series. In particular, if $k \geq 1$ is an integer and $| r \; | \leq 10^{-5}$, then

$$(\zeta(s))^k + \sum_{n-1} d_k(n)((n+\alpha_n)^{-s} - n^{-s}) \text{ has } \gg T \log T$$

zeros in $(\sigma \geq \frac{1}{2} - \delta, T \leq t \leq 2T)$ and only $\ll T$ zeros in $(\sigma \geq \frac{1}{2} + \delta, T \leq t \leq 2T)$.

Positions: Senior Professor, Tata Institute of Fundamental Research, Bombay.

Learned and Professional Societies: President, Ramanujan Mathematical Society (1988-90); Life Member, Indian Mathematical Society; National Academy of Sciences (India); Fellow, Indian Academy of Sciences and Biographical Academy of Commonwealth.

Awards and Honours: Meghnad Saha Award (UGC) (1976); UGC National Lecturer (1978).

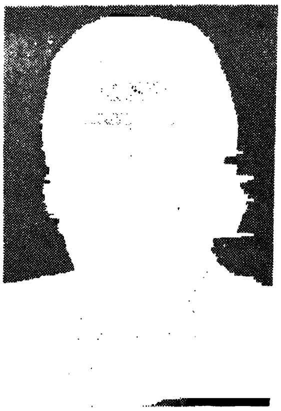
Author/Editor Facet: Editor, *Bull. Calcutta. Math. Soc.; Indian J. Pure. Appl. Math and Hardy-Ramanujan J.*

Other Contributions: Ramachandra is co-founder of Hardy- Ramanujan Society (1978).

Address: Senior Professor of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152971 (Ext 353); E-mail: kram@tifrvax.bitnet; Res: 702 (A/71N), Bhaskara, TIFR Housing Complex, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152174.

RAMACHANDRAN, Arcot

Elected 1974



Born 6 April 1923; Madras, Tamil Nadu
Ph.D., University of Purdue, USA; Doctorates (*h.c.*) from 5 universities

Specialization: Mechanical Engineering, Solar Energy

Research Achievements: Ramachandran has done highly significant research in heat transfer, energy and solar energy. He and his coworkers at IISc studied the mechanical and thermal properties and solidification characteristics of castings. They also made an in-depth study of thermal power plants in relation to the use of lignite for power generation and other aspects. Ramachandran's applied researches were heavily underpinned by fundamental research on thermophysical properties of metals and nonmetals, gases and vapours, including refrigerants. His work with coworkers also covered areas which would later have a multiplier effect on the green revolution inasmuch as they extended to heat transfer studies for food preservation.

Positions: Under-Secretary General and Executive Director, Centre for Human Settlement (Habitat, Nairobi); Secretary, Department of Science and Technology; Director-General, Council of Scientific and Industrial Research, New Delhi; Director, Indian Institute of Technology, Madras; Professor of Mechanical Engineering, Indian Institute of Sciences, Bangalore.

Learned and Professional Societies: Fellow, American Society of Mechanical Engineers, Institution of Mechanical Engineers (London) and Institution of Engineers (India); President, Solar Energy Society of India; Founder President, Indian Society of Heat and Mass Transfer.

Awards and Honours: Distinguished Alumnus Award (Purdue University) (1986); Heat Transfer Memorial Award (American Society of Mechanical Engineers).

Policy-making Bodies: During his tenure as DST Secretary the first S&T plan was approved. He was largely responsible for establishing the National Remote Sensing Agency, Ocean Science and Technology Agency, Science and Engineering Research Council, New Energy Sources Research and Development Programme, National Information System for Science and Technology, Regional Sophisticated Instruments Centres and the Central Electronics Limited. It was during his tenure that fiscal incentives for R&D in industry were introduced by the Government of India.

Other Contributions: Organized the Regional Centre for Energy, Heat and Mass Trasfer for Asia and the Pacific. Played a significant role in engineering education as Chairman, Unesco Expert Group Meeting on Engineering Education, the Unesco International Conference on Education and Training for Engineers and Technicians, the Association for Engineering Education in South and Central Asia, the Unesco Expert Group on Environment Aspect of Engineering Education etc. He was largely instrumental in the establishment of ESCAP Regional Centre for Transfer of Technology in Bangalore.

Address: 4, Crescent Road, Bangalore 560 001; Tel: (080) 265780.

RAMACHANDRAN, Balasubrahmanyan *Elected 1989*

Born 4 October 1932; Pudukkottai, Tamil Nadu
Ph.D. (1962), Catholic University of America, Washington D.C., USA

Specialization: Analytical Probability Theory

Research Achievements: Ramachandran has carried out (i) investigations on the order and type of entire characteristic functions; moments and characteristic functions, characteristic functions satisfying a certain functional equation; and (ii) investigations into the integrated Cauchy functional equation on the real line R, on R_+, on the integers Z, and on Z_+. Semi-stable processes characterized through the identical distribution of certain stochastic integrals.

Positions: INSA Senior Scientist (1993-95); Head, Indian Statistical Institute, (ISI), Delhi Centre (1982-86); In-Charge, Evening Course Centre, ISI, Madras (1964-66).

Author/Editor Facet: Co-editor *Sankhya Ser. A.* (1982-88); editor (one of six editors), *Sankhya Ser. A & B*, (1989-90); Authored/coauthored 'Advanced Theory of Characteristic Functions', (Statist.Pub. Soc. Calcutta, 1967), 'Functional Equations in Probability Theory' (Academic Press 1991), 'Characteristic Problems in Mathematical Statistics' (trans. from Russian) (Johny Wiley, 1973).

Address: INSA Senior Scientist, Indian Statistical Institute, Delhi Centre, No.7 SJS Sansanwal Marg, New Delhi 110 016; Tel.: (011) 666200, 664741 Ext 421A-12; Telex: 031- 73274 ISI IN; Fax: 91-11-6856779; E-mail: brama@isid.ernet.in; Res: 809, Sector A, Pocket C, Vasant Kunj, New Delhi 110 070; Tel: (011) 6897836.

RAMACHANDRAN, Gopalasamudram Narayana *Elected 1963*

Born 8 October 1922; Ernakulam, Kerala
Ph.D. (1949), University of Cambridge, UK; D.Sc. (1948), University of Madras; D.Sc. (*h.c.*) from Roorkee, Banaras and Hyderabad universities

Specialization: Molecular Biophysics, X-ray Crystallography Mathematical Logic

Research Achievements: Ramachandran is considered to be one of the founders of the rapidly developing field of molecular biophysics. His contributions are mainly to the theory of molecular structure of biopolymers in relation to their biological activities. In 1954-56, along with G. Kartha, he put forward the triple helical structure of collagen. Attempts to revise the details of this structure from theory led to the enunciation of the so-called Ramachandran plot for the dihedral angles (ρ, ψ) for two connected analogues. This was a turning point in the evolution of the theory of biopolymer conformation and has found application in almost all branches of biochemistry and molecular biology. It has been extended to nucleic acid and polysaccharides conformation in his laboratories. He and his group have developed methods of using anomalous dispersion of X- rays for solving the phase problem. His work on Fourier transforms led him to the formulation of the convolution technique for axial tomography. His work with A.V. Lakshminarayanan has been acclaimed as the starting point for the development of CAT scan technique in radiography and later to magnetic resonance imaging for this purpose.

Positions: INSA Albert Einstein Research Professor (1984-89); CSIR Distinguished Scientist (1982-84); Head, Mathematical Philosophy Group, IISc, Bangalore (1978-81); Head, Molecular Biophysics Unit, IISc (1970-78); Part-time Professor of Biophysics, University of Chicago (1967-78); Director, Centre of Advanced Study in Biophysics & Crystallography (1962-70), Head, Department of Physics (1952-70), and Jawaharlal Nehru Fellow, University of Madras (1968-70).

Learned and Professional Societies: Fellow, Royal Society of London, Indian Academy of Sciences, and Royal Society of Arts (London); Founder- Member, Indian Academy of Yoga and Third World Academy of Science; Hony Member, American Society of Biological Chemists; Hony Foreign Member, American Academy of Arts and Sciences; Hony Fellow, National Academy of Sciences (India) and IISc.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1961); Watumull Memorial Prize (1964); John Arthur Wilson Award (American Leather Chemists' Association) (1967); Meghnad Saha Medal (Asiatic Society) (1971); Srinivasa Ramanujan Medal

(INSA) (1972); Jagadish Chandra Bose Award (UGC) (1976); J.C. Bose Award (Bose Institute) (1977); Fogarty International Medal (NIH) (1978); IISc Alumni Award (1979), Sir C.V. Raman Medal (INSA) (1982); R.D. Birla Award (1985); CSIR Golden Jubilee Award (1991); Madhya Pradesh CSIR Jawaharlal Nehru Award (1992).

Author/Editor Facet: Co-authored 'Fourier Methods in Crystallography' (Wiley-Interscience, 1970); contributed 6 monographs/chapters/articles to advanced books; edited 7 volumes; editor, *Curr. Sci.* (1950-58) and *J. Indian Inst. Sci.* (1973-77); served as member of editorial boards of 8 journals, including *J. Mol. Biol.* and *Int. J. Prot. Pept. Res.*

Policy-making Bodies: Member, Board of Scientific & Industrial Research (1962-65); Chairman, and/or Member, National Committee for Biophysics (1967-76); Chairman, National Committee for Crystallography (1963-70); Member, IUPAB Council; Member, IUPAB Commission on Macromolecular Biophysics (1969-74); Member, various sub-commissions of the Commission on Biochemical Nomenclature of IUPAC-IUB (1966- 79).

Other Contributions: Ramachandran has worked at a Boolean Vector- Matrix Formalism for the representation of logical variables and operators. Also written a computer program in FORTRAN, called MATLOG, for computer application of this formalism. Shown that logical paradoxes must necessarily occur in any theory and that they have often found this to be the starting point for the emergence of new branches of knowledge in mathematics and theoretical physics.

Address: Gita, 5, 10-A Main, 17-A Cross, Malleswaram West, Bangalore 560055; Tel: (080) 340362.

RAMACHANDRAN, Lakshminarayanapuram Krishna Iyer

Elected 1977

Born 30 March 1928; Trichur, Kerala
Ph.D. (1953), University of Madras

Specialization: Biochemistry

Research Achievements: Ramachandran advanced our knowledge of the structure of tobacco virus protein, protein-iodine interactions, toxic and other amino acids in the *Lathyrus* species of plants. He also developed techniques for chemical modifications of proteins. The other pieces of research to which he made significant contributions are structure- activity correlations in peptide antibiotics and toxins of venoms.

Positions: Professor, Department of Biochemistry, Osmania University, Hyderabad; Held various Faculty positions in the universities of Madras, Iowa, California, Hawaii and Osmania and IISc, Bangalore.

Learned and Professional Societies: Member, Society of Biological Chemists (India) and Alpha Chi Sigma; (One-time) Member, American Chemical Society, New York Academy of Sciences and Sigma Xi.

Awards and Honours: P.S. Sarma Memorial Award (Society of Biological Chemists, India) (1973); Sir J.C. Bose Award (Hari Om Trust UGC) (1978); Andhra Pradesh State Silver Jubilee Year Teacher Award (1981).

Author/Editor Facet: Served as member, editorial boards of: *Indian J. Biochem. Biophys.* and *Biochem. Educ.*

Died 11 August 1988.

RAMAIAH, Nanduri Atchuta

Elected 1970

Born 26 August 1923; Mirthipadu, Andhra Pradesh
Ph.D. (1952), Banaras Hindu University, Varanasi

Specialization: Physical Chemistry, Sugar Chemistry and Technology

Research Achievements: Ramaiah proposed a mechanism for the origin of triggering electrons in electrode-less discharge; developed a simple analytical method for estimation of Ca in sugar-house products (adopted all over the world), correlated the visible whiteness of sugars with spectral values (adopted by Bureau of Indian Standards); studied clarification of cane juices for production of good- quality sugars in the industry;evolved norms of efficiency of operation of sugar industry; and developed procedures for improved efficiency of sugar industry.

Positions: Professor of Physical Chemistry, and Director National Sugar Institute, Kanpur; Director, Deccan Sugar Institute, Pune; Director, World Sugar Research Organization, London.

Learned and Professional Societies: Fellow, Indian Chemical Society, Royal Institute of Chemistry, and Sugar Technologists Association of India.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1966).

Lectureships: Gundu Rao Memorial Lecture (Sugar Technologists Association) (1989).

Author/Editor Facet: Served as editor of *Proc. Sugar Technol. Ass.* and hony editor of *Bharatiya Sugar.*

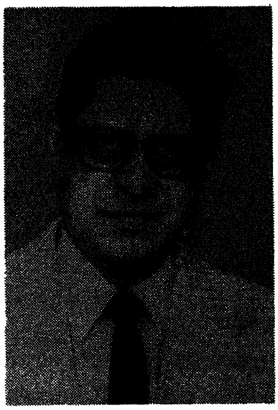
Policy-making Bodies: Council Member, International Society of Sugarcane and Sugar Technologists; Secretary, Sugar Industry Enquiry Commission, Government of India; Chairman of several Committees for Sugar Standards.

Other Contributions: Established the Deccan Sugar Institute.

Address: 14 Ocean View, Vishakhapatnam, 530 003, Andhra Pradesh, Tel: (0891) 61225.

RAMAKRISHNAN, Chandrasekharan

Elected 1992



Born 30 January 1939; Madurai, Tamil Nadu
Ph.D. (1965), University of Madras

Specialization: Molecular Biophysics

Research Achievements: Ramakrishnan has been closely associated with the classic work on Ramachandran map, now being extensively used by protein crystallographers all over the world. Other significant contribution include detailed conformational analysis of cyclic pepticides, earliest data analysis on hydrogen bonds and development of algorithms related to protein structure and modelling, all of which have found their use in the field of molecular conformation.

Positions: Professor, Molecular Biophysics Unit, Indian Institute of Science, Bangalore.

Learned and Professional Societies: Fellow, Indian Academy of Sciences,

Address: Professor, Molecular Biophysics Unit, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext) 2489; Fax: 91-80-341683; Telex: 0845-8349 IISc IN; E-mail: ramki@mbu.iisc.ernet.in; Res: E-32, Faculty Quarters, IISc, Bangalore 560 012; Tel: (080) 341103.

RAMAKRISHNAN, Palayanoor Sivaswamy *Elected 1980*

Born 24 December 1936; Palayanoor, Kerala
Ph.D. (1960), Banaras Hindu University, Varanasi

Specialization: Ecology and Sustainable Development

Research Achievements: Starting off as a population ecologist, Ramakrishnan has correlated the finer patterns of adaptation at sub-specific levels to differential micro- habitat differences. He extended this work to analyzing coexistence of closely related species and populations. His recent work, on ecology and sustainable development of the hill areas of the north-east India, is recognized as a unique effort in linking ecological science with social sciences, a new paradigm in ecological concept.

Positions: Founder Director, G.B. Pant Institute of Himalayan Environment and Development, Kosi, Almora (1988-89); Professor of Ecology, School of Environmental Sciences, Jawaharlal Nehru University, New Delhi (1985); Professor and Head, Centre for Eco-Development, Professor of Botany, School of Life Sciences, Professor and Head, Department of Botany, Dean, School of Life Sciences, all at North-Eastern Hill University, Shillong; Visiting Professor at many Indian and overseas universities.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), International Society of Tropical Ecology and Indian Botanical Society; Foundation Fellow, National Institute of Ecology, and National Academy of Agricultural Sciences (India); Member, INSA Council (1992-93).

Awards and Honours: Pitamber Pant National Environmental Award (1985); Distinguished Scientist Award (National Academy of Sciences, India) (1986); UGC National Lecturer (1986-87); Swami Pranavananda Award (UGC) (1988).

Author/Editor Facet: Published two books: 'Ecology of Biological Invasion in the Tropics' (SCOPE-sponsored) and 'Shifting Agriculture and Sustainable Development: An Interdisciplinary Study from North-eastern India' (Unesco-MAB sponsored).

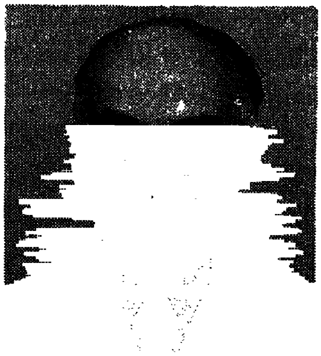
Policy-making Bodies: Member, Science Advisory Panel, Unesco- MAB, Paris (1986); Member, Planning Committee, SCOPE Paris, for the international programme 'Sustainable Biosphere Project' (SB)) (1992-95); Member, Board of Management, Tropical Soil Biology and Fertility (TSBF) (Programme of IUBS/ICSU (1990-), Indian Coordinator (Advisory), TSBF International Programme; Advisory Lead Expert to the Project on "Building Operational Strategies of Sustainable Development upon People's Initiatives", Asia and Pacific Development Centre, Kuala Lumpur (1992-93); Member, Steering and Planning Committee for proposed 'International Sustainable Biosphere Initiative' Programme etc.

Other Contributions: Contributed extensively to science and societal activities through writings and audio-visuals, as well as participatory research & development involving local communities.

Address: Professor of Ecology, School of Environmental Sciences, Jawaharlal Nehru University, New Delhi 110 067; Tel: (011) 652438, Fax: 91-11-6865886; Telex: 031-73167 JNU IN; Grams: JAYENU; Res: 1020, JNU Campus, New Delhi 110 067; Res (011) 663571.

RAMAKRISHNAN, Thekkepat

Elected 1979



Born 14 March 1922; Bangalore, Karnataka
Ph.D. (1955), University of British Columbia, Canada

Specialization: Molecular Biology of Bacteria and Viruses

Research Achievements: Ramakrishnan has elucidated the metabolism and molecular biology of mycobacteria, especially *Mycobacterium tuberculosis*. With his coworkers he unravelled the carbohydrate, protein and nucleic acid metabolism of this organism and isolated a transducing mycobacteriophage, I_3, for the first time, which can be used in mapping the genome of the organism. Elucidated the mechanism of action of antitubercular drugs like isoniazid, streptomycin and refampicin, discovered that a plasmid codes for the virulence of the organism, and that RNA polymerase of the organism is a good target for devising new drugs against it.

Positions: INSA Senior Scientist (1987-1990); Professor and Chairman, Department of Microbiology and Cell Biology (1957- 82) and Dean, Science Faculty (1982), Indian Institute of Science, Bangalore.

Learned and Professional Societies: Fellow, American Academy of Microbiology and Indian Academy of Sciences.

Awards and Honours: Watumull Award (1966); FIE Foundation Award (1982); Ranbaxy Award (1985).

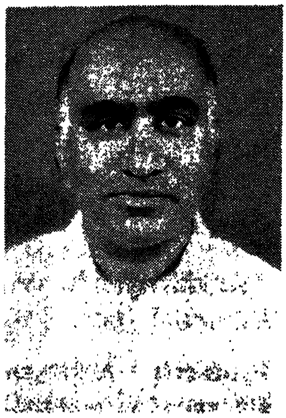
Author/Editor Facet: Published 3 manuals on the molecular biology of bacteria and viruses; served on the editorial board of *Indian J. Biochem. Biophys.*

Policy-making Bodies: Member, International Cell Research Organization, Unesco, Paris; Advisor, Leprosy, WHO, Geneva (1982).

Address: 71, KHBCS Layout, West of Chord Road, Bangalore 560 079; Tel: (080) 352083.

RAMAKRISHNAN, Tiruppattur Venkatachalamurti

Elected 1984



Born 14 August 1941; Madras, Tamil Nadu
Ph.D (1966), Columbia University, USA

Specialization: Condensed-Matter Physics, Statistical Mechanics

Research Acheivements: Ramakrishnan has made significant contributions in three areas: liquid-to-solid transition, theory of electron localization, and theory of mixed valence. Along with Youssouf, he proposed and implemented the idea that a hot solid can be regarded as a calculable, finite- amplitude, crystalline symmetry perturbation on the fluid. Ramakrishnan's work is not regarded as pure formalism but as an attempt to understand what is observed and to predict new experimental results. In his works on localization and mixed valence, he has creatively interacted with experimentalists.

Positions: Professor of Physics, Indian Institute of Science, Bangalore (1981-); Consultant, Bell Laboratories, USA (1980- 81); Visiting Fellow, Department of

Physics, Princeton University, USA (1978-81); Professor of Physics (1977-80), Assistant Professor (1970-77), Indian Institute of Technology, Kanpur.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, New York Academy of Sciences and American Physical Society.

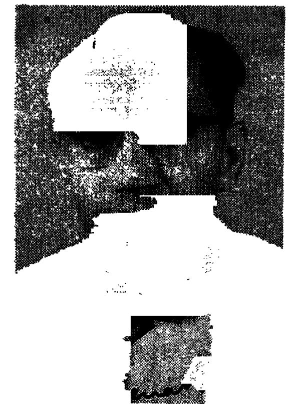
Awards and Honours: Shanti Swarup Bhatnagar Prize (1982), Devasthale Prize (1959); President's Fellow, Columbia University; UGC National Lecturer.

Author/Editor Facet: Member, editorial boards of *Physica, J. Phys. and Cond. Matt.*

Address: Professor, Department of Physics, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 315) (Off); Tel: (080) 340591 (Res).

RAMALINGASWAMI, Vulimiri

Elected 1971



Born 8 August 1921; Srikakulam, Andhra Pradesh
M.D. (1946), Andhra University; D.Phil.(1951) and D.Sc. (1967), University of Oxford, UK; D.Sc (*h.c.*), Karolinska Institute, Sweden

Specialization: Pathology, Nutrition, Medical Education

Research Achievements: Ramalingaswami described the syndrome of protein-energy malnutrition in young, growing children and elucidated its pathology and pathogenesis. Reproduced the human disease in the non-human primate model and studied the pathophysiology of this form of malnutrition, including its effect upon immunological reactivity and cell proliferation kinetics. Identified the aetiology of Himalayan endemic goitre and demonstrated its prevention by the use of iodated salt in Kangra Valley. Described the essential pathology of the liver in Indian childhood cirrhosis and identified a new syndrome of portal hypertension masquerading as cirrhosis of the liver but with better prognosis and discovered its essential pathology. Identified the major aetiological factors of nutritional anaemia in preventing nutritional anaemia in pregnancy.

Positions: Professor Emeritus, Department of Pathology, All India Institute of Medical Sciences, New Delhi; Director- General, Indian Council of Medical Research; Professor of Pathology (1957- 79) and Director (1969-79), All India Institute of Medical Sciences, New Delhi.

Learned and Professional Societies: Fellow, Royal Society of London, Royal College of Physicians (London) and Royal College of Pathologists (London); Member, Pathological Society of Great Britain and Ireland and International Academy of Pathology (USA), Nutrition Society of Great Britain, Indian Association of Pathologists and Microbiologists and Indian Association for the Advancement of Medical Education; Foreign Associate, National Academy of Sciences (USA); President, INSA (1979-80).

Awards and Honours: Watumull Award (1962); Shanti Swarup Bhatnagar Prize (1965); Basanti Devi Amirchand Prize (ICMR) (1966); Jagadish Chandra Bose Medal (INSA) (1977); Silver Jubilee Research Award (Leon Bernard Foundation-WHO) (1978); R.D. Birla National Award (1980).

Lectureships: Health Clark Lecture (University of London) (1972); Searle Lecture (American Association for the Study of Liver) (1974); Jawaharlal Nehru Memorial Lecture (1975); Jaque Parisot Lecture (WHO) (1975); J.C. Bose Memorial Lecture (1978); Vikram Sarabhai Memorial Lecture (1980).

Other Contributions: Ramalingaswami has made notable contributions to the reorientation of medical education to suit the health-needs of developing countries engaged in research strategies to promote "Health for All" by the year AD 2000.

Address: Professor Emeritus, Department of Pathology, All India Institute of Medical Sciences, New Delhi 110 029.

RAMAMURTHI, Balasubramaniam

Elected 1981

Born 30 January 1922; Madras, Tamil Nadu
M.S.(1947), University of Madras; F.R.C.S.(1947), Edinburgh, UK

Specialization: Neurosurgery, Neurosciences

Research Achievements: Ramamurthi's researches span injuries to nervous system, surgery of brain tumours, tuberculous infection of brain, neurophysiology, stereotactic surgery, consciousness and biofeedback techniques. A study of neurophysiology of the deep structures of the brain he made during stereotactic surgery led to a better understanding of movement disorders, pain and epilepsy. Investigated the yogic states of meditation and established the value of biofeedback techniques. Also studied the correlation of neurology with ayurveda and yoga. Developed techniques of prevention and treatment of head injuries.

Positions: Head, Department of Neurosurgery, Voluntary Health Services Medical Centre, Madras; Professor of Neurosurgery, Government General Hospital, Madras (1958-78); Principal, Madras Medical College, Madras (1976-78); Visiting Professor at eight foreign and twelve Indian universities.

Learned and Professional Societies: Fellow, International College of Surgeons, American College of Surgeons, Indian Academy of Sciences, and National Academy of Sciences (India); President, National Academy of Medical Sciences (India), Neurological Society of India, Association of surgeons of India, Neurosciences Society of India, Indian Association of History of Medicine, Indian Association of Biomedical Sciences; Hony Member, Australian Society of Neurosurgeons, Society of Neurological Surgeons (USA), American Academy of Neurosurgeons, Japanese Neurosurgical Society, Scandinavian Neurosurgical Society and Congress of Neurological Surgeons; Hony President, Asian and Australasian Congress of Neurosurgery and World Federation of Neurosurgical Societies; Member, INSA Council (1988-90).

Awards and Honours: INSA-TS Tirumurti Memorial Lecture Award (1985), Hony Surgeon to President of India; Dhanwantari Award Hony Brigadier; Padma Shri; Padma Bhushan.

Address: Head Department of Neurosurgery, Dr. Achanta Lakshmipathi Neurosurgical Centre, Voluntary Health Services, Adyar, Madras 600 133; Tel: (044) 2352018, 2352123; Res: 27 Second Main Road, CIT Colony, Madras 600 004; Tel: (044) 71475/71356.

RAMAMURTHI, Rallapalli

Elected 1988

Born 27 July 1936; Madras, Tamil Nadu
Ph.D. (1962), Sri Venkateswara University, Tirupati

Specialization: Comparative Animal Physiology, Environmental Biology

Research Achievements: Ramamurthi's research has uncovered the molecular mechanisms underlying acclimation to change in the salinity of the medium in freshwater and marine invertebrates with special reference to crustaceans. He demonstrated for the first time, the existence of a neuroendocrine principle in the central nervous system of crustacea that regulates sodium outflux in crabs. He and his coworkers have made a comparative study of hormonal factors regulating carbohydrate, nitrogen and lipid metabolism in different invertebrate groups with emphasis on crustacea. The results of these studies are expected to find application in aquaculture and environmental adaptations. He and his team have also made comprehensive study of toxicity evaluation, behavior, haematology and aspects of metabolism on organisms of rice field ecosystem such as crabs, snails, and fish, using pesticides and heavy metals as xenobiotics. The aim was to understand the impact of xenobiotics on non-target species with emphasis on recovery potential of organisms. Applying the image-analysis system to scan Feulgen-stained hepatic nuclei in crabs exposed to cadmium, Ramamurthi and his team found possibilities of determining the so-called 'no-effect dose' of xenobiotics.

Positions: Professor of Zoology, Hony Director, Pesticide and Industrial Toxicology Centre; Director, Rama Sarma Centre for Research in Aquaculture and Aquatic Biology, Sri Venkateswara University, Tirupati; Visiting Professor, Department of Biological Sciences, Simon Fraser University, Burnaby, Canada.

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Academy of Zoology, Academy of Environmental Biology and Indian Society of Communicable Diseases; President, Society for Reproductive Biology and Comparative Endocrinology (1981-84) and Indian Society for Life Sciences; Vice-President, Indian Society for Comparative Animal Physiology and Society for Bio-Sciences; Member, Society of Ichthyologists.

Author/Editor Facet: Associate Editor, *Indian J. Compar. Anim. Physiol.*; Member, editorial advisory board, *Compar. Physiol. and Ecol.*

Policy-making Bodies: Member, Syndicate (governing body), S.V. University (1984-85).

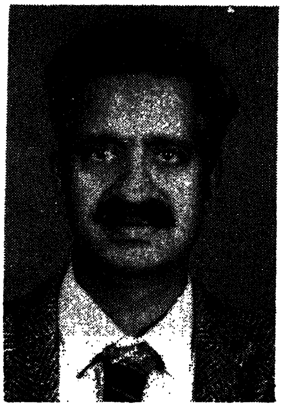
Address: Professor of Zoology, Pesticides and Industrial Toxicology Centre; Director, Rama Sarma Centre for Research in Aquaculture and Aquatic Biology; Res: No. 3, Red Buildings, SVU Campus, Tirupati 517 502; Tel: (08574) 20907.

RAMAMURTHY, Valangiman Subramanian *Elected 1987*

Born 2 April 1942; Tanjore, Tamil Nadu
Ph.D. (1971), University of Bombay

Specialization: Nuclear Physics, Application of Nuclear Techniques

Research Achievements: Ramamurthy's main research contributions span the areas of nuclear fusion and heavy ion reaction mechanism, statistical and ther-



modynamic properties of nuclei, and nuclear instrumentation. He has made many important contributions, both experimental and theoretical, in these areas. Initiated experiments on atomic cluster physics and application of nuclear techniques in related areas using a 3-MV tandem heavy ion-accelerator.

Positions: Director, Institute of Physics, Bhubaneswar; Head, Fusion Physics Section, Bhabha Atomic Research Centre, Bombay.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

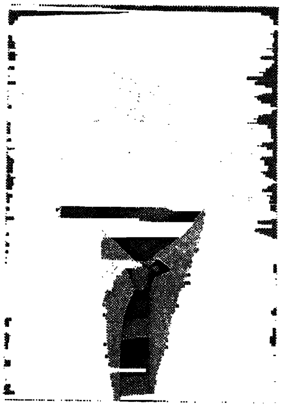
Lectureships: P.A. Pandya Lecture (Indian Physics Association).

Author/Editor Facet: Served on the editorial boards of: *Pramana, IPA News, Indian J. Phys.*, and *Curr. Sci.*

Address: Director, Institute of Physics, Bhubaneswar; Tel: (0674) 52825 (Off), (0674) 52367 (Res); Telex: 0675-386 IOP IN; Fax: 91-674-56142; E-mail: vsrm@iop b.ernet.in

RAMAMURTI, Balakrishna

Elected 1955



Born 12 August 1904; Kumbakonam, Tamil Nadu
D.Sc. (1935), University of Madras

Specialization: Mathematics and Statistics - Theory & Application

Research Achievements: Ramamurti was an authority on geometry relating to rational norm curve in n-dimensions using invariant theory of n-dimensions. He designed and carried out the all-India agricultural labour enquiry, covering a survey of about 10,000 families selected on the basis of stratified random sampling. The results were published by the Ministry of Labour in seven volumes.

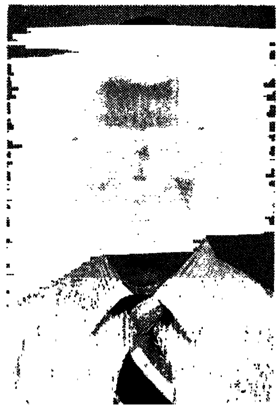
Positions: Professor of Mathematics, Government College, Ajmer (1939-43); Deputy Director (Statistics), (1943-47), Statistician, Labour Bureau, Ministry of Labour, (1947-51); and Joint Director, Cabinet Secretariat, Government of India (1957-63); United Nations Regional Statistical Centre in Asia and the Far East, Bangkok; Chief Statistician, United Nations, OPEX Scheme, Nigeria (1963-66).

Learned and Professional Societies: Member, International Statistical Institute and ILO Committee of Statistical Experts.

Awards and Honours: Srinivasa Ramanujan Prize (1936).

Died 11 August 1990.

RAMAMURTI, Viswanatha *Elected 1990*



Born 18 September 1938; Annamalai Nagar, Tamil Nadu
Ph.D. (1970), Indian Institute of Technology (IIT), Madras

Specialization: Mechanical Engineering - Stress Analysis and Vibration

Research Achievements: Ramamurti's research concerns: use of cyclic symmetric concept for predicting the static and dynamic behaviour of periodically symmetric objects like impellers, bladed discs and fabricated gear wheels; design methodology for complicated machine elements like gearbox housings, bus bodies, gear teeth, sharp shooters, rocket launchers, cement mills and turbochargers.

Positions: Professor of Applied Mechanics, IIT, Madras; Visiting Professor, Mechanical Engineering, University of Kuwait, Kuwait (1992-93); Visiting Research Professor, Mechanical Engineering, Concordia University, Montreal, Canada (1992); Distinguished Visiting Professor, Mechanical Engineering, University of Toledo, USA (1991-92); Senior Research Associate, NASA Lewis Research Centre, Clevland, USA (1981-83).

Learned and Professional Societies: Fellow, Indian National Academy of Engineering.

Awards and Honours: NRDC Import Substitution Award (1973); VASVIK Award (1983).

Author/Editor Facet: Written two books: 'Computer-aided Design in Mechanical Engineering'; and 'Computer-aided Mechanical Design and Analysis' (both by Tata McGraw-Hill).

Address: Professor of Applied Mechanics, Indian Institute of Technology, Madras 600 036; Tel: (044) 2352265; Res: 2, Fourth Main Road, Kasturba Nagar, Madras 600 020; Tel: (044) 412590.

RAMAN, Sir Chandrasekhara Venkata

Foundation Fellow

Born 7 November 1888; Thiruvanaikkaval, Tamil Nadu
M.A. (1907), University of Madras; Ph.D. (*h.c.*), D.Sc.(*h.c.*) from several universities

Specialization: Physics

Research Achievements: Raman's works essentially cover: (i) molecular diffraction of light; (ii) mechanical theory of bowed strings and diffraction of X-rays; (iii) theory of musical instruments; and (iv) physics of crystals. His discovery, the Raman effect, made it possible to map out the levels of possible energy gains of the molecules and atoms of a substance and uncover the molecular and atomic structure. By substituting measurement of colour modifications of visible X-rays, the alternative to infrared spectroscopy, viz Raman spectroscopy, provided a superbly easy experimental technique. Raman also made notable contributions to the physics of musical instruments like violin, cello, pianoforte, *veena, tanpura* and *mridangam.*

Positions: Palit Professor of Physics, University of Calcutta (1917-33); Director, Indian Institute of Science, Bangalore (1933-43); Founder Director, Raman Research Institute, Bangalore (1943-70); National Professor (1948-70).

Learned and Professional Societies: Fellow, Royal Society of London; President, Indian Academy of Sciences (1934-70); Foreign Associate, Paris Academy of Sciences; Corresponding Member, Soviet Academy of Sciences.

Awards and Honours: President, Indian Science Congress (1928); Knighted (1929); Mateuchi Medal, Rome (1929); Nobel Prize (1930); Hughes Medal (Royal Society of London) (1930); Franklin Medal (Franklin Institute), Philadelphia (1951); International Lenin Prize (1957); *Rajasabha Bushana* (Decoration by the Maharajah of Mysore) (1935); Bharat Ratna (1954).

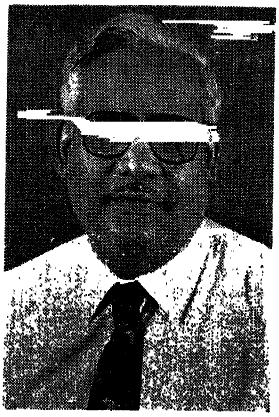
Other Contributions: "One of Raman's gifts to India is the Indian Academy of Sciences, or the Academy as it is often called." The Raman Research Institute at Bangalore is another of his many gifts to Indian Science.

INSA has instituted 'Chandrasekhara Venkata Raman Medal' in his memory.

Died 11 November 1970.

RAMANAMURTHY, Poolla Venkata

Elected 1985



Born 1 July 1929; Pallipalem, Andhra Pradesh
Ph.D. (1962), University of Bombay

Specialization: High-Energy Cosmic Ray Physics

Research Achievements: Ramanamurthy measured cosmic ray intensity to greatest depths of 8400 hg cm^{-2}. Detected cosmic ray neutrino interactions. Detected TeV gamma rays from a few celestial sources. Designed and operated a total absorption calorimeter. Set upper limits to masses and fluxes of tachyons.

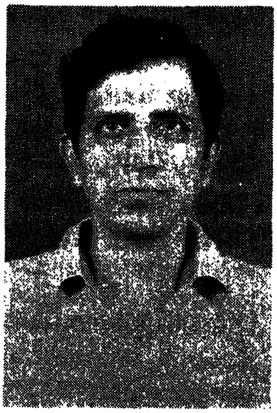
Positions: Senior Professor (Currently), Tata Institute of Fundamental Research, Bombay; Visiting Professor, University of California, Michigan, and Tokyo.

Author/Editor Facet: Co-authored 'Gamma Ray Astronomy' (CUP, 1986), edited Proc. Int. Workshop on Gamma Ray Astronomy' (Ooty, 1982); Conference Papers, 18th Int. Conference on Cosmic Rays (Bangalore, 1983).

Address: Senior Professor, Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Bombay 400 005; Tel: (022) 2152971; Fax: 091-22-2152110; E-mail: ramana@tifrvax.btnet; Res: 906, Bhaskara, Homi Bhabha Road, Colaba, Bombay 400 005; Tel: (022) 2152324.

RAMANAN, Sundararaman

Elected 1977



Born 20 July 1936; Tiruvannamalai, Tamil Nadu
Ph.D. (1966), University of Bombay

Specialization: Algebraic Geometry and Differential Geometry

Research Achievements: Ramanan obtained basic results pn vector bundles on curves. Initiated a study of very ample linear system on abelian varieties, which are non-principally polorized. Proved projective normality of Schiher varieties, Flag varieties (with A. Ramanathan). Currently, studying fundamental group, *a la* Simpson, Hitchi.

Positions: Senior Professor, Tata Institute of Fundamental Research, Bombay; Senior Visitor, Japanese Society for the Promotion of Science(1976); Visiting Professor, Hawaii University (1977-78).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India); Member, INSA Council (1993-95).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1979); Invited Address, International Congress of Mathematicians, Helsinki (1978).

Author/Editor Facet: Editor, Mathematical publications of TIFR; edited 'Proc. Conf. on Algebraic Group' (Hyderabad).

Policy-making Bodies: Member, Mathematics Panel, International Congress, Kyoto; Member, National Committee of INSA.

Address: Senior Professor, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152971; Res: 501, Meghnad, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152308.

RAMANATHAN, Kalpathi Ramakrishna

Foundation Fellow

Born 28 February 1893; Palghat, Kerala
D.Sc. (1923), University of Madras

Specialization: Physics, Astrophysics and Meteorology

Research Achievements: Ramanathan's main fields of research related to: molecular scattering of light in fluids, anisotropy of molecules, atmospheric and solar radiation, Indian monsoon, general circulation of the atmosphere, atmospheric ozone, physics of the ionosphere and aeronomy and geomagnetism.

Positions: Hony Director, Trivandrum Observatory (1918-21); Meteorologist, India Meteorological Department (1926); Director, Kodaikanal and Bombay Observatories; Superintending Meteorologist, Deputy Director-General and Officer on Special Duty (1938-48); Director and Emeritus Professor, Physical Research Laboratory, Ahmedabad.

Learned and Professional Societies: Foundation Fellow, Indian Academy of Sciences; Hony Fellow, Royal Meteorological Society (London); President, International Association of Meteorology (1951-54) and International Ozone Commission (1960-67); Member, Council (1942-44) and Vice-President (1955-56), INSA.

Awards and Honours: President, Mathematics and Physics Section, Indian Science Congress (1939); International Meteorological Organization Award for

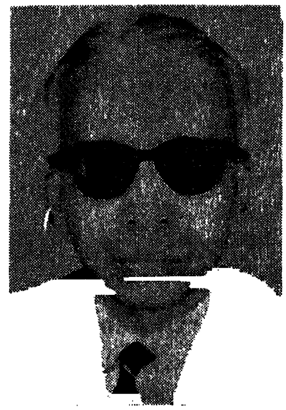
Meteorology (1961); Sisir Kumar Mitra Memorial Lecture (INSA) (1966); Aryabhatta Medal (INSA) (1977), Padma Bhushan (1965); Padma Vibhushan (1976).

Other Contributions: Under his stewardship the Physical Research Laboratory, Ahmedabad, grew into one of India's leading research centres. His involvement with International Geophysical Year (IGY) was a great fillip to PRL's growth.

INSA has instituted 'Kalpathi Ramakrishna Ramanathan Medal' in his memory.

Died 30 December 1984.

RAMANATHAN, Kollagunta Gopala Iyer *Elected 1959*



Born 13 November 1920; Hyderabad,
Andhra Pradesh
Ph.D. (1951), Princeton University, USA

Specialization: Algebra and Theory of Numbers

Research Achievements: Ramanathan earned international repute for his work on analytic theory of quadratic forms, modular functions and discontinuous groups. He did extensive work on Ramanujan's manuscripts and Eisenstein series. The work he did on automorphic functions related to Siegel formula is a seminal contribution to analytic number theory.

Positions: Senior Professor, School of Mathematics, Tata Institute of Fundamental Research, Bombay; Jawaharlal Nehru Fellow (1971-73).

Learned and Professional Societies: Fellow, Indian Acadmey of Sciences; Foundation Fellow, Maharashtra Academy of Sciences; Member, Indian Mathematical Society; Member, INSA Council (1974- 76).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1965); UGC National Lecturer (1965); Homi J. Bhabha Medal (INSA) (1984); Padma Bhushan (1983).

Author/Editor Facet: Member, Editorial Board, *Acta Arith.*.

Died 11 May 1992.

RAMANATHAN, Natesan *Elected 1982*

Born 31 December 1923; Needamangalam, Tamil Nadu
Ph.D. (1951), University of Bombay; Ph.D. (1955), University of Leeds, UK

Specialization: Biophysics, Fibre Physics and Leather Technolgoy.

Research Achievements: Ramanathan correlated the electron microscopical structure of collagen fibres leather with their physical properties and established how these are influenced by biological and environmental factors. His discovery of the directional friction effect in collagen fibres helped rectify defects in hides. He helped develop a new shoe-sizing system.

Positions: Director, Central Leather Research Institute, Madras; Hony Professor, Anna University, Madras.

Learned and Professional Societies: Founder Fellow, Tamil Nadu Academy of Sciences; Fellow, Textile Institute (UK); Member, Electron Microscope Society of India.

Awards and Honours: Invention Promotion Board's Award (1969, 1984).

Author/Editor Facet: Edited a book titled 'Collagen' (John Wiley, 1962).

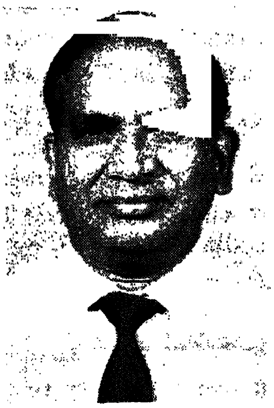
Policy-making Bodies: Chairman, Appropriate Technology Cell, Government of India; and of many technical committees of ISI and CSIR.

Other Contributions: Contributed to the promotion of leather industry in India as Director of Karnataka Leather Industries Development Corporation, Tamil Nadu Leather Development Corporation and Bharat Leather Corporation.

Died 6 August 1986.

RAMANIAH, Mangipudi Venkata

Elected 1980



Born 14 May 1927; Andhra Pradesh
Ph.D. (1956), University of Washington, USA

Specialization: Nuclear Chemistry, Radiochemistry, Plutonium Technology

Research Achievements: Ramaniah has done radiochemical studies of fission of actinides. He has shown that the one-, two- and three- peeked mass distributions in low-energy fission are due to the relative contributions of the symmetric and asymmetric modes of fission, which, in turn, depend on the difference in the barrier heights for these modes. This difference depends on the neutron number rather than on the proton number of the fissioning nucleus. His work has also shown the influence of the doubly magic shell at mass 132 on the total kinetic energy and its distribution.

Positions: Director, Radiology Group (1979-87), and Head, Radiochemistry Division (1965-80), Bhabha Atomic Research Centre, Bombay; Officer-in-charge, Nuclear Materials Accounting Cell, Department of Atomic Energy (1973-87); IAEA Expert in Radiochemistry, Instituto Energia Atomica, Sao Paulo, Brazil (1963-64).

Learned and Professional Societies: Fellow, Royal Institute of Chemistry (London), Maharashtra Academy of Sciences and Andhra Pradesh Academy of Sciences; President, Indian Association of Nuclear Chemists and Allied Scientists (1984-87); Founder President, Indian Nuclear Society (1989-90).

Lectureships: Joliot-Curie Memorial Lecture (University of Poona) (1992).

Author/Editor Facet: Member, editorial advisory board of *Radiochim. Acta* (1965-77).

Policy-making Bodies: Member, Standing Advisory Group on Safeguard Implementation to Director-General, IAEA, Vienna (1975- 83) and a number of UN bodies concerned with nuclear energy; Chairman, Safety Review Committee of Department of Atomic Energy and Member, Atomic Energy Regulatory Board (1986-87).

Address: 44, Sarasbaug, Deonar, Bombay 400 088; Tel: (022) 5511798.

RAMANNA, Raja

Elected 1973

Born 28 January 1925; Tumkur, Karnataka
Ph.D. (1948), University of London, UK; D.Sc. (*h.c.*) from several universities; Hony Degree of Desikottama (D.Litt.), Visva Bharati

Specialization: Nuclear Physics

Research Achievements: Ramanna's significant research achievements are in the field of design and commissioning of research reactors, experimental and theoretical investigations of neutron thermalization and neutron scattering, investigations on fission, including a stochastic theory of the fission process, a geometric theory of atomic and nuclear structure, nuclear exploration for civilian applications, planning accelerator programmes, fast-reactor development and defence-oriented research programmes. More specifically, Ramanna collaborated in the design, installation and commissioing of the research reactors Apsara and Cirus and the variable energy cyclotron (Calcutta) and fast-breeder test reactor (Kalpakkam). Led the group which was reponsible for the nuclear explosion (Pokharan, 1974) aimed at exploiting the atom for socio-economic uses.

Positions: Director, National Institute of Advanced Studies, Indian Institute of Science (IISc) Campus, Bangalore (1987- Jan 1990, Dec 1990-), Chairman, Governing Council, IISc, Bangalore; Chairman, Atomic Energy Commission and Secretary, Government of India, Department of Atomic Energy (1983-87); Director, Bhabha Atomic Research Centre (1972-78 and 1981- 83); Scientific Adviser to Minister of Defence, and Director- General, Defence Research and Development Organization, and Secretary, Government of India, for Defence Research (1978-81).

Learned and Professional Societies: Fellow, Indian Academy of Sciences (Vice-President, 1977-78) and Indian Society of Engineers; President, Indian Physics Association; Hony Fellow, IISc and TIFR; President, INSA (1977-78).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1963); Meghnad Saha Medal (INSA) (1984); Pandit Jawaharlal Medal (Madhya Pradesh Government) (1983); Om Prakash Bhasin Award (1985); R.D. Birla Memorial Award (Indian Physics Association) (1985-86); Rajyotsava State Award (Karnataka Government); President, 30th General Conference, IAEA; Padma Shri (1968); Padma Bhushan (1973); Padma Vibhushan (1975).

Lectureships: Meghnad Saha Memorial Lecture (Saha Institute of Nuclear Physics) (1984); Shri Ram Memorial Lecture (Shri Ram Institute for Industrial Research) (1985).

Author/Editor Facet: Written autobiography 'Years of Pilgrimage'(1991), 'The Structure of Music in Raga and Western Systems' (1993).

Policy-making Bodies: Member, Rajya Sabha (1990-92); served as Minister of State for Defence (1990); Member, Scientific Advisory Committee to the Union Cabinet; Member, Scientific Advisory Committee, IAEA, Vienna; and of several other national and international scientific policy-making bodies.

Other Contributions: Ramanna is currently grappling with the philosophical foundations of quantum mechanics. Also pursuing his lifelong interest in Music, exploring the structure of music.

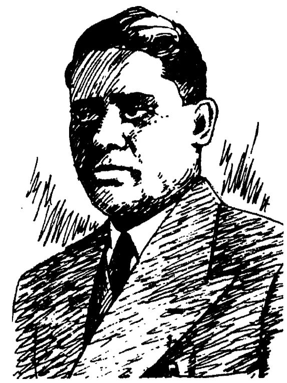
Address: Director, National Institute of Advanced Studies, Indian Institute of Science Campus, Bangalore 560 012; Tel: (080) 344351, 346594, 346251; Fax:

91-80-346634; Res: 407, II Block, 9th Cross Road, Rabindranath Tagore Nagar, Bangalore 560 032; Tel: (080) 330815, 333284.

RAMANUJAM, Srinivasa *Elected 1948*

Born 2 October 1903; Vanavasi, Tamil Nadu
Ph.D. (1937), University of London, UK

Specialization: Botany - Cytogenetics



Research Achievements: Ramanujam's main contribution to Indian agriculture was in the field of cytogenetics and plant breeding. He and his team identified and studied, for the first time in India, haploids, triploids and tetraploids in rice from the point of view of their usefulness in plant breeding; they obtained artificial mutations by irradiation of seeds. A cytological survey of a group of plants to which rice (*Oryza sativa)* belongs shed light on the origin of the genus *Oryza* and its genetic composition. He and his coworkers also produced polyploids of a number of Indian crop plants by the use of colchicine. Furthermore, they identified and studied several artificially induced and naturally occurring mutations in a number of crop plants like chilli, gram, and mustard.

Positions: Second Economic Botanist, Indian Agricultural Research Institute, New Delhi (1938-46); Director, Central Potato Research Institute, (1946-51, 1952-56), Central Rice Research Institute, Cuttack (1951-52), Agricultural Research, Government of Bihar, Patna (1956-66).

Learned and Professional Societies: Founder Member (also President), Indian Society of Genetics and Plant Breeding; Member, Genetical Society of Great Britain and British Association for the Advancement of Science.

Awards and Honours: President, Botany Section, Indian Science Congress (1952).

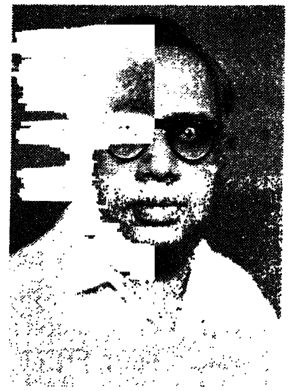
Other Contributions: As the first Director of CPRI, Ramanujam put it on a strong foundation; so also with Bihar's agricultural research.

Died 9 June 1979.

RAMANUJAM, Srinivasa *Elected 1983*

Born 25 June 1925; Palamcottah, Tamil Nadu
Ph.D. (1978), Agra University

Specialization: Genetics and Plant Breeding



Research Achievements: Ramanujam's research aimed at improving crops of importance to India's agriculture, particularly from the standpoint of nutrition. These included essential-oil/alkaloid- bearing crops and oilseeds. Applying the principles of biometrical genetics, Ramanujam analyzed the population structure, mating system and flexibilities and genetic systems in a wide variety of these crops, and gathered the basic knowledge necessary for improving these crops. He showed that, contrary to earlier assumptions of a limited genetics base in pulse crops, there is considerable genetic divergence. Based on such analysis as well as detailed analysis of heterotic hybrids, he came up with methodologies for their improvement. He also attempted to find short-term and long-term solutions to increasing pulse production. Elucidated the population structure, mating flexibilities and genetic architecture of several essential- oil/alkaloid-bearing plants and developed methodologies which has led to improved populations of these crops.

Positions: Project Corordinator, All India Pulse Programme (1968- 70); Head, Genetics Division, Indian Agricultural Research Institute, New Delhi.

Learned and Prbfessional Societies: Fellow, Indian Society of Genetics and Plant Breeding.

Author/Editor Facet: Edited, *Indian J. Genet. Plant Breed.*

Died 10 December 1984.

RAMASARMA, Tangirala

Elected 1989

Born 13 May 1932; Gudivada, Andhra Pradesh
Ph.D. (1956), University of Bombay

Specialization: Biochemistry

Research Achievements: Ramasarma has elucidated the biosynthetic interrelationship of ubiquinone and cholesterol; and described the inhibition of H-MGCoA reductase, the key enzyme in cholesterol biosynthesis, by Fe^{2+} Fermodulin, garlic disulphide and hydrogen peroxide. A model of rapid burst of H_2O_2 generation was shown with dicavanadate.

Positions: CSIR Emeritus Scientist, Professor of Biochemistry, Department of Biochemistry, Indian Institute of Science, Bangalore.

Learned and Professional Societies: Member, Society of Biological Chemists (India), Biochemical Society (UK), and Society of Sigma Xi (USA).

Awards and Honours: Professor P.S. Sarma Memorial Award (Society of Biological Chemists, India) (1977); University of Mysore Silver Jubilee Award (1980); FICCI Award (1988).

Lectureships: M. Damodaran Memorial Lecture (Kerala University) (1988); Mrs Sitalakshmi Bhagavantam Memorial Lecture (Andhra Pradesh Academy of Sciences) (1992).

Author/Editor Facet: Associated with the editorial boards of: *Biochem. Educ., Mol. Cell. Biochem.* and *Indian J. Biochem. Biophys.*

Policy-making Bodies: Member, IUB Committee on Biochemical Education.

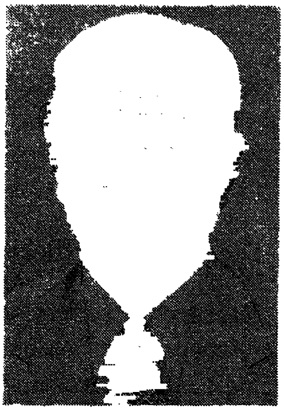
Other Contributions: Conducted BEST Programme of Society of Biological Chemists (India).

Address: CSIR Emeritus Scientist, Department of Biochemistry, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2307); Telex: 0845 8349 IISC IN: Fax: 91-80-341683; Res: Shashikiran Apartments, 408, 18th Cross Road, Malleswaram, Bangalore 560 055; Tel: (080) 346134.

RAMASESHAN, Sivaraj

Elected 1972

Born 10 October 1923; Calcutta
D.Sc. (1951), Nagpur University



Specialization: Crystallography, Materials Science

Research Achievements: Ramaseshan's main contributions are to optics, X-ray crystallography, anomalous scattering of X-rays and neutrons and high-pressure physics (fundamental research) and to materials science --fibre reinforced composites, electrocomposites, and novel methods of fabrication (applied research).

Positions: Distinguished Professor-Emeritus, Raman Research Institute, Bangalore (1984-); Director (1980-84), Indian Institute of Science (IISc), Bangalore; Scientist F and Scientist

(Director's grade), National Aerospace Laboratory, Bangalore (1966-79); Head (1962-66), Faculty (1945-62), Department of Physics, IISc, Bangalore.

Learned and Professional Societies: Fellow (Vice-President, 1971- 80; President 1981-84), Indian Academy of Sciences; Member, INSA Council (1974-76).

Awards and Honours: UGC National Lecturer; Shanti Swarup Bhatnagar Prize (1966); Jawaharlal Nehru Fellow (1977-79); VASVIK Award (1980); Aryabhatta Medal (INSA) (1985); Padma Bhushan.

Author/Editor Facet: Co-authored 'Anomalous Scattering' (Munsgard, 1976); co-authored a chapter on Crystal Optics in 'Handbuch der Physik' (Springer-Verlag, 1961) and several other chapters to "Progress in..." series reference works; editor of *Pramana*, *Proc. Indian Acad. Sci.* and *Curr. Sci.*

Policy-making Bodies: Vice-President, International Union for Crystallography (IUCr) (1981-84); Served as Chairman, Materials and Processes Panel of Aeronautics Research & Development Board; Chief Coordinator, Commonwealth Aeronautical Advisory Research Council; Member, COSPAR Interdisciplinary Scientific Commission on Materials Science in Space; Member, Executive Committee, IUCr; and Member, Karnataka State Council for Science and Technology; and of several other policy-making bodies.

Other Contributions: Established one of leading interdisciplinary centres in materials research at NAL.

Address: Distinguished Professor-Emeritus, Raman Research Institute, Bangalore 560 080; Tel: (080) 340122 (Off), (080) 369108 (Res).

RAMASWAMI, Ladapur Srinivas

Elected 1957

Born 1 January 1907; Bangalore
D.Sc. (1938), University of Madras

Specialization: Reproductive Biology of Mammals

Research Achievements: Ramaswami's most significant work was on the *langur* monkey's reproductive biology. This study was undertaken to select a suitable monkey species that could be used as a model for studying the reproductive biology of the human female, leading eventually to population control.

Positions: Senior Professor of Zoology and Head, University of Rajasthan, Jaipur; Director, Primate Project, Institute for Research in Reproduction, Bombay.

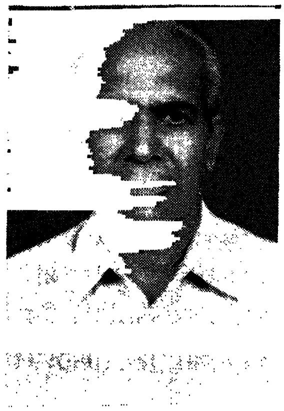
Learned and Professional Societies: Life Member, Indian Society of Developmental Biology; Member, Primatological Society of India (sometime President); Member, INSA Council (1971-73).

Awards and Honours: Sunder Lal Hora Medal (INSA) (1975).

Leactureships: Mrs. Shantha Rao Oration (Institute for Research in Reproduction).

Died 18 May 1987.

RAMASWAMY, Guruvayur Subramaniam *Elected 1972*



Born 3 October 1923; Guruvayur, Kerala
C.E. (1948), California Institute of Technology, USA

Specialization: Structural Engineering

Research Achievements: Ramaswamy's main contributions are in concrete shell roofs. His most outstanding contribution to concrete shells has been the development of the funicular shell which needs no reinforcement.

Positions: Founder and first Director, Structural Engineering Research Centre (CSIR); UN Chief Technical Advisor to Government of Trinidad and Tobago; UN Advisor to the Government of Iraq; UN Advisor to the Deputy Minister of Transportation, Saudi Arabia; Visiting Professor, University of West Indies and University of Arizona, USA.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Member, INSA Council (1975-77).

Awards and Honours: Indian Merchant's Chamber Diamond Jubilee Award; Invention Promotion Board Award; Invention Promotion Shield; Gammon Award (Institution of Engineers, India).

Author/Editor Facet: Authored, 'Design and Construction of Concrete Shell Roofs' (McGraw-Hill, 1968; 2nd edn Krieger, 1984), hailed as a classic reference work all over the world. and 'Modern Prestressed Concrete Design' (Pitman V.78).

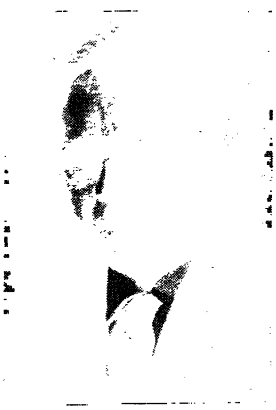
Policy-making Bodies: Member, International Advisory Board, International Association for Shells and Spatial Structures, Madrid.

Other Contributions: Ramaswamy was largely responsible for the setting up of the Structural Engineering Research Centre of CSIR, Building Research Centre (Baghdad) and Caribbean Industrial Research Institute (Trinidad) from their conceptual stages.

Address: E 119, 'Sans Souci', 16th Cross, Besant Nagar, Madras 600 009; Tel: (044) 4914872; Fax: 91-44-866827.

RAMDAS, Lakshminarayanapuram Ananthakrishnaiyer

Elected 1935



Born 3 June 1900; Palghat, Kerala
Ph.D. (1927), University of Calcutta

Specialization: Physics, Agricultural Meteorology

Research Achievements: Ramdas worked on problems of the volume and surface scattering of light by liquids and vapours. Measured the changes taking place in the temperature and moisture content of air layers close to the ground, up to a height of about 10 ft from early morning to late afternoon hours. Found that just above the heated land there were narrow jets of rising hot air alternating with broader areas of descending cold air. His research spanned: (i) micrometeorology, (development of instruments) (ii) radiation; (iii) soil physics, (iv) plant physiology in relation to meteorological factors, (v) statistical crop- weather relationship and analysis of meteorological data.

Positions: Assistant Meteorologist, Meteorological Office, Karachi (1926-30); Meteorologist-in-charge, Agricultural Meteorology Section, Meteorological Office, Pune (1931-40); Director (1940-53), Deputy Director-General of Observatories (1953-56), India Meteorological Department, Government of India; Assistant Director (1956-60), National Physical Laboratory, New Delhi (1956-60); CSIR Emeritus Scientist (1965-70).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Indian Meteorological Society, Royal Meteorological Society (London), World Academy of Art and Science, and Indian Geophysical Union; Member, American Meteorological Society (President, Physics Section, 1948); Member, INSA Council (1945-47, 1950-52).

Awards and Honours: President, Physics Section, Indian Science Congress (1948); Padma Shri (1958).

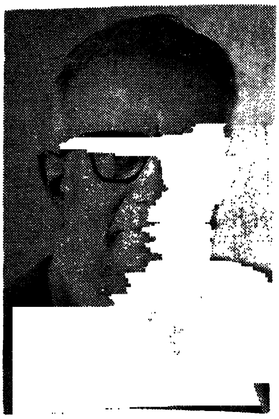
Other contributions: Organized the Agricultural Meteorology Section of Meteorological Office, Pune.

Died 1 January 1979.

RAMIAH, Krishnasamy

Elected 1942

Born 15 April 1892; Kilakarai, Tamil Nadu
D.Sc. (1953), Utkal University



Specialization: Plant Genetics and Breeding

Research Achievements: Ramiah was responsible for coordination of rice research in the country. The improved varieties of rice he had evolved were grown on several million hectares in Madras Presidency and elsewhere. At the Central Rice Research Institute, Cuttack, he introduced a seasoned crop of rice in canal-irrigated areas and encouraged the use of fertilizers in fields. His work shed light on the origin of cultivated rice.

Positions: Geneticist and Botanist, Institute of Plant Industry, Indore (1938-46); Director, Central Rice Research Institute, Cuttack (1946-51); Rice Consultant, FAO (1951-57); Special Officer, ICAR (1957-64); Adviser, Planning Commission; Vice- Chancellor, Orissa University of Agriculture & Technology, Bhubaneshwar (1965-68).

Learned and Professional Societies: Foundation Fellow, Indian Academy of Sciences; Fellow, National Academy of Sciences (India); Hony Fellow, Japanese Breeding Society; Vice- President, INSA (1969-70).

Awards and Honours: MBE ((1938); The International Rice Year Medal (ICAR) (1956); Sunder Lal Hora Medal (INSA) (1969); Padma Shri (1956); Padma Bhushan (1970).

Policy-making Boidies: Member, Rajya Sabha.

Other Contributions: Ramiah was largely responsible for putting CRRI, Cuttack on a firm footing.

Died 2 August 1988.

RANADIVE, Kamal Jaysing *Elected 1977*

Born 8 November 1917; Pune, Maharashtra
Ph.D (1950), University of Bombay

Specialization: Experimental Biology, Cell Biology (Cancer Research, Leprosy Research)

Research Achievements: Ranadive has contributed to the experimental study of etiology and mechanism of carcinogenesis at cell and systematic levels; breast cancer, oral cancer, and experimental carcinogens specific to India; tissue, cell and organ cultures of mouse tumours, human tumours and embryonic cell - establishment of cell lines *in vitro* and transplantable tumours *in vitro*; human leprosy - isolation and cultivation of 'ICRC bacillus' from lepromatous leprosy.

Positions: Emeritus Medical Scientist, ICMR; Head, Biology Division, Cancer Research Institute, Tata Memorial Centre (1966- 77); Acting Director, Indian Cancer Research Centre, Bombay (1962-66); Head, Department of Experimental Biology (1952-62).

Learned and Professional Societies: Founder Fellow, Maharashtra Academy of Sciences; Member, American Tissue Culture Association, Japanese Tissue Culture Association, British Cancer Research Association and Internatioal Society of Cell Biology; Core Founder Member, Indian Women Scientists Association (President, 1977-79); Member, INSA Council (1985- 87).

Awards and Honours: Basanti Devi Amirchand Award (1958); G.J. Watumull Memorial International Award (1964); First Silver Jubilee Research Award (Medical Council of India) (1964); Sandoz Oration Award (1976); Distinguished Woman Award (Banaras Hindu University Mahila Mahavidyalaya) (1982); Silver Jubilee Gold Medal (Medical Council of India); Sandoz Gold Medal; Padma Bhushan (1982).

Author/Editor Facet: Served as member of the editorial boards of: *Indian J. Cancer, Indian J. Exp. Biol., Int. J. Cancer, Indian J. Med. Res.*, and *Yearbk Cancer.*

Policy-making Bodies: Served on ICMR'S Scientific Advisory Board, Expert Committee on Cellular and Molecular Biology, and Consultative Committee for Coordination of Cancer Research in India; and Committees of International Union against Cancer.

Other Contributions: Ranadive is engaged in medico social work, especially tribal welfare with reference to nutrition, lifestyle and cancer.

Address: 1/27, Nishingandh, New MIG Colony, Western Express Highway, Bandra East, Bombay 400 051; Tel: (022) 549506.

RANDHAWA, Mohinder Singh

Elected 1943

Born 2 February 1909; Zira, Punjab
D.Sc. (1955), Panjab University; D.Sc. (*h.c.*) (1974), University of Udaipur

Specialization: Agriculture, Horticulture

Research Achievements: Randhawa was a specialist in phycology, floriculture and agriculture. Did extensive work on morphology, taxonomy, distribution and ecology of algae.

Positions: Secretary, Imperial Council of Agricultural Research, New Delhi (1945-46); Additional Director-General, Rehabilitation and Director-General, Rehabilitation, Punjab (1949-51); Commissioner, Ambala Division (1951-53); Development Commissioner, Rehabilitation and Custodian, Evacuee Property (1953-55), Punjab; Vice-President, Indian Council of Agricultural Research and Additional Secretary, Government of India, Ministry of Food and Agriculture (1955- 60); Adviser, Natural Resources, Planning Commission (1961- 64); Special Secretary, Ministry of Food and Agriculture (1964-66); Chief Commissioner, Union Territory, Chandigarh (1966-68); Vice-Chancellor, Punjab Agricultural University, Ludhiana (1968-76).

Learned and Professional Societies: Patron, Northern India Science Association; Fellow, Indian Academy of Sciences; President, National Academy of Sciences (India) and Phycological Society of India; Vice-President, Indian Society of Agricultural Statistics; Member, Council (1947, 1959-61), Treasurer (1948), Vice-President (1979-80), INSA.

Awards and Honours: Punjab University Robe of Honour for Services to Punjabi Literature (1968); Grant Gold Medal (Royal Agro- Horticultural Society of India, Calcutta) (1971); Innovator in Agriculture Honour (President of India) (1976); Silver Jubilee Commemoration Medal (INSA) (1979); Padma Bhushan (1972).

Author/Editor Facet: Co-authored 'Evolution of Life (CSIR, 1968), 'Zygnemaceae' (ICAR, 1959), and 'Flowering Trees in India' (ICAR, 1961); served as chief editor of ICAR publications and of CSIR's (Publication and Information Directorate) Monographs on Botany series.

Policy-making Bodies: Served on numerous governing bodies/committees of ICAR, CSIR, ISI (now BIS), and other bodies.

Other contributions: An all-round personality, Randhawa contributed to India's development in general, rural uplift in particular.

Died 3 March 1986.

RANDHAWA, Narinder Singh

Elected 1981

Born 13 March 1927; Naushera Pannu, Punjab
Ph.D. (1964), University of California, Davis, California, USA

Specialization: Soil Science, Agronomy, Agriculture

Research Achievements: Randhawa's researches aim at improving and sustaining productivity of soils through basic and applied work including field investigations. His major thrust areas are in soil chemistry and soil fertility and plant nutrition especially micronutrients in soils and plants. He has focused on critical limits of micronutrients, transformation in soils, nutrient interactions, amelioration of their deficiencies and their effects on plant and livestock health.

Positions: Secretary to Government of India, Department of Agricultural Research & Education, Ministry of Agriculture, and Director-General, ICAR, New Delhi; Deputy Director General (Soils, Agronomy and Engineering Research Education), ICAR (1979- 85); National Coordinator, All India Coordinated Project on Micronutrients in Soils and Plants (1967-77), Dean, College of Agriculture, Director of Research, Special Director of Research (1973-79), Professor, Senior Professor and Head of Soils Department (1967-73), all at Punjab Agricultural University, Ludhiana.

Learned and Professional Societies: Fellow and Vice- President, National Academy of Agricultural Sciences (India); Foreign Associate, All Union Academy of Agricultural Sciences, USSR; and Hony Member, Indian Society of Soil Sciences (sometime President), Indian Society of Plant Nutrition (sometime President); Member, INSA Council (1993-95).

Awards and Honours: Rafi Ahmed Kidwai Memorial Prize (ICAR) (1975); National Citizen Award (1990); Padma Bhushan (1990).

Lectureships: Professor N.R. Dhar Memorial Lecture (National Academy of Sciences, India) (1993).

Author/Editor Facet: Authored monographs on 'Micronutrients' (ICAR and FAO); 'National Agriculture Research System of India' (FAO); 'Neem -- Research and Development' (Society of Pesticide Science,India).

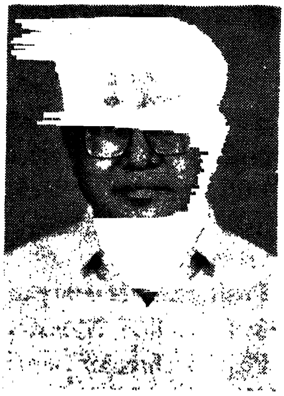
Policy-making Bodies: Member, Research Advisory Council, Australian Centre for International Agricultural Research (1986- 90); Vice-Chairman, International Crops Research Institute for Semi-Arid Tropics Hyderabad (1985-90); Represented India as Member of Consultative Group for International Agricultural Research, Washington DC, USA (1985-90).

Address: Pusa Apartments, Flat H-7, Plot H-2, Sector 15, Rohini, Delhi 110 085; Tel: (011) 5784490 (Off) (011) 7290069 (Res).

RANGANATHAN, Srinivasa

Elected 1981

Born 10 January 1941; Cuddalore, Tamil Nadu
Ph.D. (1965), University of Cambridge, UK



Specialization: Physical Metallurgy and Materials Science

Research Achievements: Ranganathan has contributed to physical metallurgy by examining metastable structures obtained by solid state and rapid solidification processing. Made a pioneering contribution to theory for the atomic configuration at grain boundaries in a publication which became a citation classic. His analysis of the geometry of grain boundaries led to an (eponymous) generating function for coincidence site lattices. Discovered two-dimensional decagonal and one-dimensional trigonal quasi-crystals and ordered quasi-crystals. He uses geometric insights to elucidate the structure as well as the microstructure by high resolution microscopic techniques.

Positions: Chairman, Department of Metallurgy, Indian Institute of Science, Bangalore, (currently); Head, Department of Metallurgical Engineering, and Coordinator, School of Materials Science & Technology, Banaras Hindu University (BHU), Varanasi; Golden Jubilee Visiting Professor, BHU, Varanasi (1990); Karnataka State Industrial Investment Development Corporation Chair (1991-93); Ontario Centre for Materials Research Distinguished Lecturer, Canada (1992).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Indian National Academy of Engineering and National Academy of Sciences (India).

Awards and Honours: UGC National Lecturer (1984); National Metallurgists' Day Award (1970); Kamani Gold Medal (Indian Institute of Metals, IIM) (1971); Birla Gold Medal (IIM) (1989); Materials Research Society of India Medal (1991); INSA Prize for Materials Science (1991).

Author/Editor Facet: Served as editor/member of editorial boards of many journals, including *Acta Metallur. Material.* and *Scrip. Metallurg. Material.*, authored 'Materials Characterization', 'Nonstructured Materials' and 'Metals, Materials and Processess'.

Other Contributions: Identified national priorities in the field of advanced materials for Scientific Advisory Committee to the Prime Minister.

Address: Professor, Centre for Advanced Study, Department of Metallurgy, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Off), 340521 (Res); Fax: 91-80- 341683; E-mail: rangu@metallurg.iisc.in

RANGANATHAN, Subramania

Elected 1981

Born 2 February 1934; Tirur, Kerala
Ph.D. (1962), Ohio State University, USA

Specialization: Organic and Bio-organic Chemistry

Research Achievements: Ranganathan has evolved novel and practical routes to all prostaglandins based on the properties of nitroethylene and bicyclo(2.2.1)heptanes on the one hand, and the restructuring of Indian castor oil, on the other. He has shown castor oil to be a veritable fountain for a variety of potent insect sex-pheromones and useful synthons. Added a new facet to the "principles of the conservation of orbital symmetry" by rationalizing "non- observed symmetry allowed reactions" on the basis of experiment and theory. His experimental studies pertaining to the evolution of life by organization of molecular constellations have revealed diverse aspects of the genesis and operation of information systems and template operations in life processes.

Positions: Professor, Department of Chemistry (1981-), Professor- in-charge, Faculty Affairs (1980-81), Professor and Head of Department of Chemistry (1977-80), Indian Institute of Technology, Kanpur.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

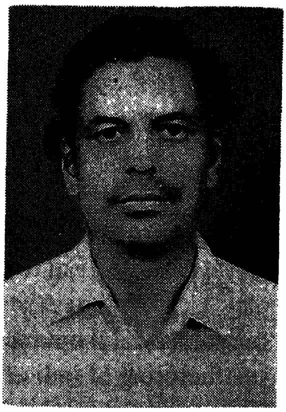
Awards and Honours: Basudev Banerjee Medal and Prize (1975); Shanti Swarup Bhatnagar Prize (1977); UGC National Lecturer (1980).

Lectureships: Professor K. Venkataraman Memorial Lecture (1979); Professor A.B. Kulkarni Lecture (University of Bombay) (1982); Professor M.V. Subba Rao Memorial Lecture (1985).

Author/Editor Facet: Authored 'Fascinating Problems in Organic Reaction Mechanisms' (Holden-Day, 1967); co-authored three more books including 'Art in Organic Synthesis' (Holden-Day, 1970); editor and co-founder of *Curr. Org. Chem. Highlights* and associate editor of *Sci. Resour. Lett.*

Address: Professor, Department of Chemistry, Indian Institute of Technology, Kanpur 208 016; Tel: (0512) 214251 (Ext 2486); Res: 660, IIT Campus, Kanpur; Tel: (0512) 214251 (Ext 8590).

RANGARAJAN, Sarukkai Krishnamachary *Elected 1982*



Born 9 September 1932; Madras, Tamil Nadu
B.A. (Hons) (Maths) (1953), Univerity of Madras

Specialization: Electrochemistry, Theoretical Chemistry

Research Achievements: Rangarajan's contributions pertain to: (i) a unified theory of phenomenological coupling at the interfaces, including nucleation and growth kinetics; (ii) a new theory of fluctuations and stochastic modelling of interfacial phenomena; (iii) discovery of novel relaxation techniques; (iv) charge- separation (electrical double layer) and adsorption, based on new statistical mechanical models of interfaces; and (v) quantum mechanical descriptions of chemisorption and electron transfer across charged interfaces. He is considered to be one of the foremost theoretical electrochemists in the world.

Positions: Professor, Indian Institute of Science (IISc), Bangalore; Director, Central Electrochemical Research Institute, Karaikudi; Professor, Department of Inorganic and Physical Chemistry, IISc, Bangalore; Visiting Professor, Washington DC and Georgetown University, USA; Homi Bhabha Fellow (1970-72); Senior Research Associate (1964-65) and Science Research Council Senior Visiting Professor (1977), University of New Castle-upon-Tyne, UK.

Learned and Professional Societies: Fellow, Indian Academy of Science.

Address: Department of Inorganic and Physical Chemistry, Indian Institute of Science, Bangalore 560 003; Tel: (080) 344351 and Director, Central Electrochemical Research Institute, Karaikudi; Tel: (04565) 2064, 2088; Telex: 0443- 211 ECRI IN; Fax: 04565-2088; E-mail: Skr!csirb!csirb!vikram!shakti!uunet; Res: Director's Bungalow, CECRI KaraiKudi; Tel: (04565) 2156.

RANGASWAMI, Srinivasa

Elected 1961

Born June 1912; Tiruvaiyaru, Tamil Nadu
Ph.D. (1938), Andhra University, Waltair; D.Phil (1948), University of Basel, Switzerland

Specialization: Natural Products Chemistry

Research Achievements: Rangaswami discovered Peruvoside, a potent cardiotonic drug. He initiated work on chemistry of wood-rotting fungi and complicated structure of saponins in India. Elucidated the structure of several novel steroidal and triterpenoidal substances.

Positions: Adviser to General Manager (R&D), IDL Chemicals, Hyderabad; Professor of Organic Chemistry, University of Delhi, Delhi; Professor of Pharmaceutical Chemistry, Andhra University, Waltair.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Indian Chemical Society, Royal Society of Chemistry; President, Indian Pharmaceutical Association; Treasurer, INSA (1969-72).

Awards and Honours: Silver Jubilee Commemoration Medal (INSA) (1970).

Lectureships: Sir P.C. Ray Memorial Lecture (Indian Chemical Society) (1973).

Author/Editor Facet: Coauthored 'Peruvoside and Other Cardiotonic Glycosides of *Thevetia neeriifolia*' and 'Chemistry of Vitamins and Hormones'; Coedited 'Advancing Frontiers in the Chemistry of Natural Products' and 'Some Recent Developments in the Chemistry of Natural Products'; Member, Editorial Board of *J. Pure Appl. Chem.*

Policy-making Bodies: Chairman, Advisory Committee on Indigenous Drugs (ICMR); Member, Pharmacy Council of India, Drug Technical Advisory Board, Indian Pharmacopoeia Committee and Ayurveda, Siddha and Homeopathic Pharmacopoeia Committee; Secretary, National Committee for Chemistry.

Address: 9/9, Turnbull's Road, Nandaram, Madras 600 035.

RANGASWAMY, Nanjangud Sreekantaiah

Elected 1989

Born 8 May 1932; Srirangapattana, Karnataka
Ph.D. (1960), University of Delhi

Specialization: Plant Tissue Culture and Biotechnology, Morphogenesis

Research Achievements: Rangaswamy has many firsts to his credit: (i) establishment of cultures of nucellus and mature endosperm, (ii) test-tube fertilization in angiosperms, and *in vitro* seed germination in obligate root parasites, (iii) establishing the role of certain secondary metabolites in somatic embryogenesis, and (iv) elucidating that hard-seededness is a correlative function of the structure and chemistry of testa.

Positions: Professor, Department of Botany, University of Delhi; Visiting Scientist, Czechoslovak Academy of Sciences (1969-70), Visiting Professor and Unesco Fellow, Harvard University and University of Hawaii (1971-72), Ford Foundation Exchange Fellow, Nagoya University (1976-77); UGC Visiting Fellow, Nagpur University (1986).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), International Society of Plant Morphologists and Plant Tissue Culture Association (India).

Awards and Honours: S. Navashin Memorial Medal (USSR) (1990).

Lectureships: Professor Parija Memorial Lecture, (Utkal University) (1986); Street Memorial Lecture (North Eastern Hill University) (1989).

Author/Editor Facet: Co-authored 'Pollen Biology - A Laboratory Manual' (Springer-Verlag, 1992); co-edited 'Plant Tissue Culture : a Symposium' (1963).

Address: Professor, Department of Botany, University of Delhi, Delhi 110 007; Tel: (011) 7257725; Res: KC-29 B, Ashok Vihar, Phase I, Delhi 400 052; Tel: (011) 7222636.

RAO, Akella Kameswara

Elected 1988

Born 17 September 1929; Madras, Tamil Nadu
Ph.D. (1958), University of London, UK

Specialization: Aeronautics, Mechanical and Electrical Engineering

Research Achievements: Rao has made pioneering contributions to: (i) development of fatigue design and testing methods; (ii) exploitation of full potential of polar functions of elasticity solutions to various in-plane, bending and torsion problems of significance to aerospace structures; (iii) introduction of continuum concepts back into finite element theory and developing of hybrid finite elements for problems of stress concentrations, fracture mechanics and short fibre composites; (iv) development of inverse formulation and its application to hitherto intractable problems of fastener joints; (v) reliability and maintainability of airfleet; and (vi) concepts in acoustic emission for monitoring damage growth and predicting failure.

Positions: CSIR Emeritus Scientist, National Aerospace Laboratory, Bangalore; Director, Engineering Staff College of India, Hyderabad; Professor of Aerospace Engineering, KSIIDC Professor of Mechanical Sciences, Chairman of Department, Dean, Engineering Faculty, Department of Aerospace Engineering, Indian Institute of Science, Bangalore; Visiting Professor, Laval University, Monash University and University of New South Wales; Senior Design Engineer, Folland Aircraft Ltd., Southampton (UK).

Learned and Professional Societies: Fellow, Indian National Academy of Engineering; Hony Fellow, Indian Society for Non- destructive Testing (President elect), Institution of Engineers (India); Aeronautical Society of India (President, 1991-92), Indian Society for Advancement of Material Process Engineering, Indian Society for Theoretical and Applied Mechanics and Aeronautical Society of India.

Awards and Honours: Honour Summus Award and Gold Medal (Watumull Foundation, USA); Sir R Venkataratnam Naidu Gold Medal (Andhra University); National Aeronautical Prize (Aeronautics Society of India).

Lectureships: Biren Roy Lecture (Aeronautical Society of India); B.R. Seth Lecture (Indian Society for Theoretical and Applied Mechanics).

Author/Editor Facet: Editor, *J. Aeronaut. Soc. India.*

Policy-making Bodies: Rao has rendered advisory/consultancy services to industrial corporations as well as governmental/ quasi-governmental organzations, which include: Bristol Aeroplane Co. (UK), Lockheed Georgia Co (USA), Lockheed International Research Institute (USA), NASA (USA), Acoustic Emission Corp. (USA), Bharat Electronics Ltd., Nuclear Power Corporation, Hindustan Aeronautics Ltd., Aeronautical Development Authority, Indian Space Research

Organization, Defence R&D Organization, and Commonwealth Advisory Aeronautics Research Council and many others.

Address: CSIR Emeritus Scientist, National Aerospace Laboratory, Bangalore 560 017 and Director, Engineering Staff College of India, Hyderabad 500 004; Tel: (080) 573351; Fax: 91-80 560862; Telex: 0824-2279 NAL IN; E- mail: viman;csirb;iisc;ernet.in (prof. a.k.rao); Res: Scientist Aparments No. SA-31, NAL, Kodihalli Bangalore 560 017; Tel: (080) 565991, 565100.

RAO, Araga Ramesha

Elected 1990

Born 27 July 1937; Araga
Ph.D. (1968), Rajasthan University, Jaipur

Specialization: Animal Sciences, Cancer Biology & Radiation Biology

Research Achievements: Rao has published an incisive work on the quantitative analysis of the male and female germ cell population changes in mammals exposed to internal irradiation. Employing murine mammary carcinogenesis model system, he has shown that the Relative Biological Effectiveness (RBE) for neutrons is much larger at low doses of neutrons than at high doses. His first report on the enhancing effects of tobacco and betelnut and suppressing effect of betel leaf on B(a) P-induced buccal carcinogenesis in hamster model system. His other important contribution is on the occurrence of tumors in decreasing frequency among successive litters (F-2 generation members) born to F-1 generation female mice exposed prenatally to the carcinogen, and the inhibition of this transplacental carcinogenesis by butylated hydroxyanisole. He has also shown that exogenous insulin inhibits the initiational event and stimulates the promotional event in DMBA- induced mammary carcinogenesis in rats. His remarkable finding has shown the inhibitory actions of *Asparagus racemosus* and *Piper betle* on DMBA-induced mammary carcinogenesis in rats. Exposure of mice to exogenous Gonadotropin prior to the carcinogen administration would enhance ovarian tumor incidence. His work has established the carcinogenic/cocarcinogenic, genotoxic and teratogenic potentials of the Betelnut in animals. His work shows the inhibitory action of Aminoglutethimide on DMBA-induced mammary carcinogenesis in rats. Using murine experimental cervical cancer model system, he has shown the chemopreventive actions of retinoic acid and butylated hydroxyanisole. His is the first report on the immunosuppressive action of Arecoline, the betelnut alkaloid.

Two affinity Chromatography methods for the purification of Glyoxalase I enzyme have been described by him. Dr Rao is one of the leading workers in the field of Cancer Biology in India.

Positions: Professor, Cancer Biology Laboratory, School of Life Sciences, Jawaharlal Nehru University.

Learned and Professional Societies: Fellow, National Academy of Sciences.

Awards and Honours: NIH International Postdoctoral Fellowship Award (USA) (1970-72); Yamagiwa-Yoshida Memorial International Cancer Study Grant Award (UICC) (1985).

Author/Editor Facet: Paper on 'Dual Effect of Insulin on mammary Carcinogenesis' one of the best paper published in India on Cancer in 1983.

Address: Professor, Cancer Biology Laboratory, School of Life Sciences, Jawahar Lal Nehru University, New Delhi 110 067; Tel: (011) 667676 (Ext 246); Res: 114, Uttarakhand, New JNU Campus, New Delhi 110 067; Tel: (011) 6866243.

RAO, Barri Ramachandra

Elected 1969

Born 21 November 1922; Yellamanchili, Andhra Pradesh
D.Sc. (1949), D.Sc. (*h.c.*) (1970), Andhra University

Specialization: Space Physics, Ultrasonics, Electronics

Research Acheivements: Rao is an authority in ultrasonics, space physics and electronics. He motivated his researchers to build their own apparatus for their work. As a result, a large number of instruments for ionospheric and ultrasonic research--pulse oscillographs, high-power pulse transmitters, pulse receivers, satellite signal-recording equipment, ultrasonic measuring instruments, and seismic sounders were developed. He and his team also developed a high-power doppler meteor radar which could detect, measure and track individual meteor trails in the atmosphere during day and night. These instruments have been adopted and are being used by several industrial complexes.

Positions: Chairman (part-time), National Fisheries Advisory Board, Ministry of Agriculture (1989); Vice-Chairman, University Grants Commission, New Delhi (1978-82); Professor, Department of Physics, Andhra University, Waltair (1958-78).

Learned and Professional Societies: Founder Fellow, Andhra Pradesh Academy of Sciences (President, 1975-76); Fellow, Indian Academy of Sciences, National Academy of Sciences (India) (President, 1981-82), Astronomical Society of India, Indian Physics Association and Acoustical Society of India (President, 1980-82); Vice-President, Asian Physical Society; Member, Council (1972-74) and Treasurer (1977-80), INSA.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1965); President, Indian Science Congress (1983).

Lectureships: Professor S. Bhagavantam 60th Birthday Commemoration Lecture (1977); Sir C.V. Raman Endowment Lecture (Madurai Kamaraj University) (1981); G.P. Chatterjee Fellowship Lecture (Bengal Engineering College) (1982).

Author/Editor Facet: Edited three books: 'Physics of the Solid State' (Academic Press), 'Bhagavantam Volume' (Bangalore Press), and 'Science, Technology and Education for Prosperity'.

Policy-making Bodies: Member, Rajya Sabha (1982-88), CSIR Society and Governing Body (1977-89), Science and Engineering Council, DST (1977-81), Indian National Committee of IUPAP and High-Power Committee on Tropo-Communication Network; Chairman, Indian National Committee of URSI; Hony Consultant to DRDO.

Other Contributions: Established a school of Ionospheric and Space Research at Waltair; as UGC Vice-chairman, he introduced several imaginative and innovative educational plans. Also, as Vice-President of Association for Continuing Education, he has been serving the cause of education.

Address: 9-15-17, C.B.M. Compound, Vishakhapatnam 530 003; Tel: (0891) 51279.

RAO, Bellur Rama

Foundation Fellow

Born 20 November 1890; Chitradurga, Karnataka
B.A. (Hons) (1914), University of Madras

Specialization: Geology

Research Achievements: Rao worked independently on a revision survey of selected schist belts and remapping of Holenarsipur Schist belt on the scale 4 in. = 1 mile, which brought him fame. He carried out surveys in Maddur and Malavalli (part of Chitradurga Belt) and made a valuable report on the geological and mineral survey of 700 sq. miles of Baria State. Studied commengtonite-bearing limestone and cordierite-sillimanite- bearing rocks. Created a geophysical section in the Department and started drilling explorations. Also set up an ore-dressing unit.

Positions: Director, Mysore Geological Survey (1935); Deputy Director and Director, Mysore Geological Department.

Learned and Professional Societies: President, Geological, Mining and Metallurgical Society of India and Geological Society of India (1964); Member, INSA Council (1943-46).

Awards and Honours: President, Geology Section, Indian Science Congress (1936).

Author/Editor Facet: Wrote an autobiography 'Recollections of an Indian Geologist'; introduced a new series of popular books, authoring the first of the series titled 'An Introduction to Mysore Geology'.

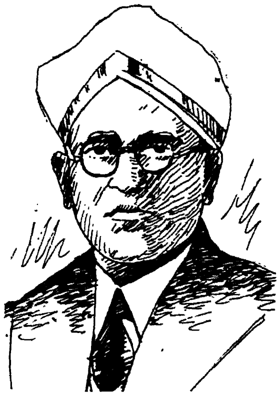
Other Contributions: Rama Rao's works were later to become the nucleus of the country's minerals policy; he also introduced a training course in geology.

Died 15 February 1970.

RAO, Bijoor Sanjiva

Elected 1944

Born 23 February 1896
D.Sc. (1946), University of London, UK



Specialization: Inorganic, Physical and Mineral Chemistry

Research Achievements: Sanjiva Rao had specialized in colloid chemistry and the chemistry of sulphur compounds. He made investigations on rice also.

Positions: Professor of Inorganic and Physical Chemistry (1926), Principal (1946), Central College, Bangalore; Professor of Inorganic and Mineral Chemistry (1947), Indian Institute of Science, Bangalore (1947); Professor of Chemistry, Gauhati University, Jalukbari.

Learned and Professional Societies: Member, INSA Council (1957).

Awards and Honours: President, Chemistry Section, Indian Science Congress (1948).

Policy-making Bodies: Member, Indian delegation to Seventh General Assembly of Unesco.

Died (Date N.A.)

RAO, C.R. Narayana

Foundation Fellow

Born 15 July 1882

Specializtion: Zoology

Research Achievements: Rao made significant contributions to biology in general and zoology in particular.

Positions: Professor, Department of Zoology, and Principal, Central College, Bangalore; Professor of Zoology, University of Mysore.

Learned and Professional Societies: Fellow, Indian Academy of Sciences (sometime Secretary).

Awards and Honours: President, Zoology Section, Indian Science Congress (1939).

Author/Editor Facet: Rao was editor of *Curr. Sci.*, and an acknowledged master of technical prose.

Other contributions: Established and organized the Department of Zoology at Central College, and later the zoological laboratory at University of Mysore. A renowned educationist and an inspiring teacher, he taught, after retirement, not zoology but English language, to undergraduate classes.

Died 25 January 1960.

RAO, C.V. Hanumantha

Foundation Fellow

M.A.

Positions: Professor, Panjab University, Lahore

Died (Date N.A.)

RAO, Calyampudi Radhakrishna

Elected 1954

Born 10 September 1920; Hadagali, Karnataka
Sc.D. (1965), University of Cambridge, UK; D.Sc. (*h.c.*) from several universities; D.Litt., University of Delhi; Ph.D., University of Tempere

Specialization: Mathematical Statistics

Research Achievements: Rao has made pioneering contributions to statistical theory and applications, which are incorporated in textbooks on statistics. The results which bear his name are: Cramer-Rao inequality, Rao- Blackwellization, Fisher-Rao theorem, Kagan, Linnik-Rao theorem, Second order efficiency, Rao's U-test, Rao's quadratic entropy, Rao's score test, Rao's distance, Rao-Rubin theorem, Haming-Rao bound. Rao's orthogonal arrays, and Neyman-Rao test.

Positions: Eberly Professor of Statistics, Pennsylvania State University, USA (1988-); University Professor, University of Pittsburgh, USA (1979-88); National Professor (1987-92); Jawaharlal Nehru Professor (1976-84); Secretary and Director, Indian Statistical Institute, Calcutta (1972-76).

Learned and Professional Societies: Fellow, Royal Society of London, and Third World Academy of Sciences; Foreign Hony Member, American Academy of Arts and Science; Hony Member, International Statistical Institute (President, 1977-79), Royal Statistical Society, and Biometric Society (President, 1973-75); President, Institute of Mathematical Statistics, USA (1976-77); Vice- President, INSA (1973-74).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1963); Guy Medal (Royal Statistical Society, UK) (1965); Meghnad Saha Medal (INSA) (1969); S.S. Wilks Medal (American Statistical Association) (1989); Silver Plate (Andhra Pradesh Academy of Sciences) (1984).

Lectureships: Wald Memorial Lecture (1975); Ramanujan Memorial Lectures (CSIR) (1987); Platinum Jubilee Lecture (Indian Science Congress) (1988).

Author/Editor Facet: Authored 11 books; contributed a chapter to 'Statistical Data Analysis and Inference' (Elsevier, 1989); edited *Sankya.*

Policy-making Bodies: Rao has served on numerous national, governmental advisory boards, and review committees of academic institutions to help develop statistical training and research.

Address: Eberly Professor of Statistics, Department of Statistics, The Pennsylvania State University, 327, Classroom Building, University Park, PA 16802, USA; Tel: 814-865-3194; Fax: 814-863-7114; E-mail:crrl@psuvm.psu.edu

RAO, Chillapalli Venkata *Elected 1966*

Born 21 November 1910
Ph.D. (1949), Delaware University, USA; D.Sc. (*h.c.*) Andhra University, Waltair

Specialization: Chemical Engineering

Research Achievements: Rao has made very significant contributions to the study of various areas in chemical engineering: heat-transfer in empty channels and fluidized beds; condensation of vapours; spray, packed and perforated plate liquid extraction columns; distillation and absorption in perforated plate columns; liquid-liquid and vapour-liquid equilibria; ionic mass transfer in empty channels; packed and fluidized beds; vibration and pulsation technique in transfer processes; extraction of vanadium from iron ores and reaction kinetics.

Positions: Hony Professor, Emeritus Professor, Department of Chemical Engineering, University College of Engineering, Andhra University, Waltair.

Learned and Professional Societies: Life Member, Indian Institute of Chemical Engineering; Fellow, Andhra Pradesh Academy of Sciences.

Awards and Honours: Andhra University Golden Jubilee Award

Lectureships: H.L. Rao Memorial Lecture (1978).

Address: Hony Professor, Department of Chemical Engineering, Andhra University, Waltair 471 124; Res: 47-11-24, Dwarka Nagar, Vishakhapatnam 530 016.

RAO, Chintamani Nagesa Ramachandra *Elected 1974*

Born 30 June 1934; Bangalore, Karnataka
Ph.D. (1958), Purdue University, USA; D.Sc. (1960), University of Mysore; D.Sc (*h.c.*) from 22 universities

Specialization: Solid State Chemistry, Surface Science, Spectroscopy and Molecular Structure

Research Achievements: Rao has contributed widely to several aspects of spectroscopy and structure by employing vibrational, electronic and high-energy spectroscopies. Besides complex molecules, he has investigated molecular interactions by these techniques. An important area of vital interest to which he has made monumental contributions is solid state chemistry. In this area, he has carried out extensive studies related to tailor- making of complex solids, structure-property relations, defect solids, phase transitions, superconducting materials and novel synthetic methods. Also contributed significantly to surface science, fullerenes and metal clusters.

Positions: Director, Indian Institute of Science and President, Jawaharlal Nehru Centre for Advanced Scientific Research; and various faculty positions at IISc and Indian Institute of Technology, Kanpur.

Learned and Professional Societies: Founder President, Materials Research Society of India and Past-President, Indian Academy of Sciences; Fellow, The Royal Society, London; Foreign Associate, National Academy of Sciences (USA); Hony Foreign Member, American Academy of Arts & Sciences; Foreign Member, Russian Academy of Sciences, Polish Academy of Sciences, Czechoslovakian Academy of Sciences, Serbian Academy of Sciences and Slovenian Academy of Sciences; Member, Pontifical Academy of Sciences; Founder Fellow (also Vice- President), Third World Academy of Sciences; Hony Fellow, Royal Society of Chemistry (London), Institution of Engineers (India) and Institution of Electronics and Telecommunication Engineers (India); Hony Member, Materials Research Societies of Japan and Korea, and International Academy of Ceramics; President, INSA (1985-86).

Awards and Honours: Past-President, Indian Science Congress Association; Marlow Medal (Faraday Society, England) (1967); Shanti Swarup Bhatnagar Prize (1968); Yedanapalli Medal and Prize (Indian Chemical Society) (1973); Sir C.V. Raman Award (UGC) (1975); Centennial Foreign Fellowship (American Chemical Society) (1976); FICCI Award (1977); S.N. Bose Medal (INSA) (1980); The Royal Society of Chemistry (London) Medal (1981); P.C. Ray Medal (Indian Chemical Society) (1984); Jawaharlal Nehru Award (1988); G.M. Modi Award (1989); Hevrovsky Gold Medal (Czechoslovak Academy of Sciences) (1989); Meghnad Saha Medal (INSA) (1990); CSIR Golden Jubilee Award (1991); Kamal Kumari Foundation Award (1992); Goyal Prize (1992); Padma Shri (1974); Padma Vibhushan (1985).

Lectureships: P.M. Blackett Memorial Lecture (Royal Society- INSA) (1990); US National Academy of Sciences-INSA Lecture and several lectureships in India and abroad.

Author/Editor Facet: Authored/co-authored more than 30 books/monographs, including 'New Directions in Solid State Chemistry' (CUP, 1986); and 'Superconductivity Today' (Wiley, 1992) associated with the editorial boards of more than 20 leading journals.

Policy-making Bodies: Chairman, Scientific Advisory Council to the Prime Minister; President, IUPAC; Vice-President, International Organization of Chemistry for Development. Rao has been actively involved in national science policy and was a member of the first National Committee on Science and Technology and later of several of the Science Advisory Councils.

Other Contributions: Rao is involved in science education and popularization; author or editor of many books and other publications related to chemical education. He was chairman of IUPAC Committee on teaching for many years and has been editor of several journals in chemical physics, solid state science and spectroscopy.

Address: Director, Indian Institute of Science and , President, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore 560 012; Tel: (080) 3341690 (Off); 3340580 (Lab); 3341254, 3345910 (Res); Telex: 0845-8349 IISC IN; Fax: 91-80-3341683; E-mail: iisccamp@vigyan.ernet.in

RAO, H. Srinivasa *Elected 1937*

Born 16 July 1894
D.Sc. (1925), University of Madras

Specialization: Zoology

Research Achievements: An eminent zoologist with great experience of faunistic, systematic, morphological and biological work, Rao was incharge of the invertebrate collections of the Indian Museum.

Positions: Assistant Superintendent, Zoological Survey of India, Calcutta.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Died 19 August 1971.

RAO, K. Rangadhama *Elected 1937*

D.Sc., Universities of Madras and London, UK

Specialization: Spectroscopy

Research Achievements: An eminent physicist and a contemporary of A.L. Narayan and R.K. Asundi, Rao was an innovator. He made his own Schumann plate for the vacuum grating spectrography and studied the spectrum of selenium and resonance spectrum of hydrogen.

Positions: Professor in Physics, Andhra University; Principal, Andhra University College, Waltair.

INSA has instituted 'Professor K. Rangadhama Rao Memorial Lecture'.

Died (Date N.A.)

RAO, Kalya Jagannatha

Elected 1986

Born 7 December 1940; Kalya, Karnataka
Ph.D. (1987), Indian Institute of Technology, Kanpur; D.Sc. (1988), Indian Institute of Science (IISc), Bangalore

Specialization: Physical Chemistry and Solid State Chemistry

Research Achievements: Rao has investigated a variety of glasses and amorphous solids and has contributed to the understanding of their structures and stability, particularly the phenomenon of glass transition. Studied a number of zirconia-toughened ceramics and ceramics based on silicon nitride. Fast ion transport in glasses, molecular dynamics simulation and solid state MAS NMR are the other important areas of Rao's interest.

Positions: Chairman, Division of Chemical Sciences (1992-), Tatachem Professor of Chemistry (1992-), Professor, Solid State and Structural Chemistry Unit (1984-), Chairman, Materials Research Centre (1984-91) all at IISc, Bangalore; Scientist, National Aerospace Laboratory, Bangalore (1972-78).

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

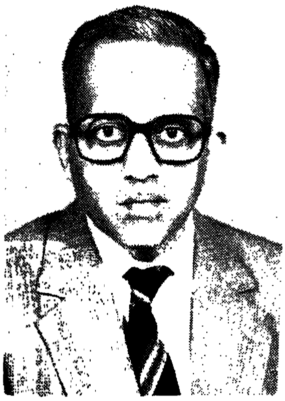
Awards and Honours: Shanti Swarup Bhatnagar Prize (1984).

Author/Editor Facet: Authored/co-authored two books: 'Phase Transition in Solids' (McGraw-Hill, 1979) and 'Current Trends in Science and Technology of Glasses'; associate editor, *Bull. Mat. Sci.*

Address: Professor, Solid State & Structural Chemistry Unit, Indian Institute of Sciences, Bangalore 560 012; Tel: (080) 344411 (Ext 2583); Telex: 0845-8349 IISC IN; Fax: 91-80-341683; Res: No. 25, 'Srinidhi' Interdisciplinary Study from North- eastern India' (Unesco-MAB NTI Layout, I Phase, Nagasetti Halli, Bangalore 560 024; Tel: (080) 331129.

RAO, Krishnarao Raghavendra

Elected 1989



Born 7 May 1936; Bangalore, Karnataka
Ph.D. (1969), Banaras Hindu University, Varanasi

Specialization: Lattice Dynamics, Computer Simulation, Neutron Beam Research

Research Achievements: Rao has carried out experimental studies of lattice dynamics of a variety of materials like Pb, Zn, Mg, KNO_3, Sb_2S_3, Mg_2SiO_4, Fe_2SiO_4, $C_2(CN)_4$ and others by inelastic neutron scattering techniques; and of dynamics of liquids like A, CH_4, CCl_4, CD_4 by neutron scattering. Also carried out theoretical investigations of a number of complex ionic materials by lattice dynamics approach and computer simulation.

Positions: Head, Solid State Physics Division, Bhabha Atomic Research Centre (1990-); IAEA Expert in Neutron Scattering in Bangladesh and Korea; Post-Doctoral Resident Research Associate, National Research Council and National Academy of Sciences, USA (1970-72).

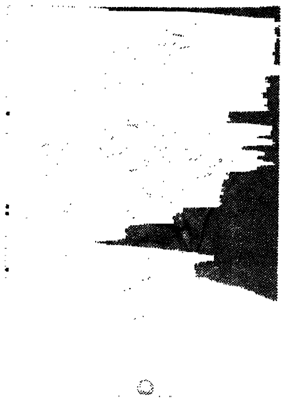
Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Author/Editor Facet: Edited 'Current Trends in Lattice Dynamics' (Indian Physics Association, 1978); and a special issue on 'Physics Instruction in India' of *Indian J. Pure Appl. Phys.* (1990); general editor, *Phys. News* (1988-90); member of editorial boards of: *Indian J. Pure Appl. Phys.* and *Pramana.*

Address: Head, Solid State Physics Division, Bhabha Atomic Research Centre, Trombay, Bombay 400 085; Tel: (022) 5518378; Telex: 011-71017 BARC IN; Fax: 91-22- 5560750; E-mail: krrao@magnum.barct1.ernet.in; Res: 7B, Purnima (DAE Quarters), Ridge Road, Trombay, Bombay 400 085; Tel: (022) 3626458.

RAO, Lakshmeshwar Rama

Elected 1939



Born 23 March 1896; Bangalore, Karnataka
M.A. (1934), University of Calcutta

Specialization: Geology - Stratigraphy and Palaeontology

Research Achievements: Rao studied the Cretaceous Trichinopoly rocks which were known to be full of organic remains. His discovery of fossil algal remains in Cretaceous beds of South India led to a great deal of subsequent work. His other areas of work covered dynamic geology, palaeontology and stratigraphy. The study of Cretaceous - Eocene boundary, which he initiated, has now assumed global significance. He concluded that no definite line really separates the two major Eras. His volume entitled 'Cretaceous Tertiary Formation of South India' is considered a landmark contribution to Indian geology.

Positions: Principal, and Professor of Geology, Central College, Bangalore, (then) University of Mysore.

Learned and Professional Societies: Foundation Fellow, Indian Academy of Sciences; Fellow, Asiatic Society and Geological Society of India.

Awards and Honours: Pramatha Natha Bose Medal (Asiatic Society); President, Geology Section, Indian Science Congress (1940).

Author/Editor Facet: Edited *Proc. Indian Acad. Sci. (Sec. B)* and *J. Geol. Soc. India*; the latter becoming a leading learned journal during his stewardship; his works were published as a special GSI memoir, 'Palaentology Indica'.

Other Contributions: Rao played a key role in founding the Geological Society of India.

Died 11 November 1974.

RAO, Mattegunta Venkata Radhakrishna

Elected 1945

Born 1 November 1903
Ph.D. (1935), Andhra University, Waltair

Specialization: Pathology, Nutrition

Research Achievements: Rao worked on the diseases of the liver in children and on human nutrition. He was considered an authority on the subject by his peers.

Positions: Assistant Director and Head, Department of Nutrition and Experimental Pathology, Haffkine Institute, Bombay; Nutrition Expert, Government of Bombay.

Learned and Professional Societies: Member, Pathological Society of Great Britain and Ireland, Nutrition Society of Great Britain.

Awards and Honours: President, Medical and Veterinary Sciences Section, Indian Science Congress (Once).

Other Contributions: He organized Department of Nutrition at Haffkine Institute.

Died 27 October 1971.

RAO, Manchanahalli Rangaswamy Satyanarayan *Elected 1992*

Born 24 January 1948; Mysore, Karnataka
Ph.D. (1973), Indian Institute of Science (IISc), Bangalore

Specialization: Molecular Biology, Chromosome Structure and Function

Research Achievements: Satyanarayana Rao has studied the influence of testis-specific histones on chromatin structure of meiotic chromosomes in great detail. Discovered a germ- cell- specific lamin, which is highly conserved through evolution. He has identified and characterized the meiotic DNA repair sites.

Positions: Professor, Department of Biochemistry, IISc (1991-); Visiting Associate Professor, Harvard Medical School; Chairman, Centre for Genetic Engineering, IISc, Bangalore (1990-).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India).

Awards and Honours; Shanti Swarup Bhatnagar Prize (1988); Professor P.S. Sarma Memorial Award (Society of Biological Chemists, India) (1985).

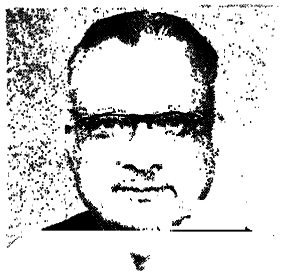
Lectureships: Platinum Jubilee Lecture (Indian Science Congress) (1991).

Author/Editor Facet: Associate editor, *J. Biosci.*; member editorial board,*Indian J. Biochem. Biophys.*

Address: Professor, Department of Biochemistry, Indian Institute of Science, Bangalore 560 012; Tel: (0812) 344411/ 2547; Telex: 0845-8349 IISc IN; Fax: 91-0812- 341683; E-Mail: mrs@cgeiisc.ernet.in

RAO, Naladurga Srinivasa Govinda

Elected 1962



Born 6 February 1907; Mysore, Karnataka
B.E. (Civil) (1928), University of Mysore

Specialization: Hydraulic and Irrigation Engineering, Civil Engineering

Research Achievements: Rao produced a new theory of cavitation damage and a criterion for accurate determination of cavitation inception, and designed a new type of cavitation tunnel. With V. Ganesha Iyer, he designed the world's biggest siphons. Also designed a new type of current meter for measuring river discharges and made significant contributions to the knowledge of (i) submerged hydraulic jump, (ii) dissipation of energy of high- velocity flows, (iii) branch channel flow, (iv) scour, turbulence and inception of air entrainment in high-velocity flows and (v) measurement of flow through new types of weirs, notches, orifices etc.

Positions: Adviser, Central Board of Irrigation and Power, Ministry of Irrigation and Power, Government of India (1967-71); Professor and Head, Department of Civil and Hydraulic Engineering, Indian Institute of Science, Bangalore (1950-67).

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Indian Academy of Sciences, and American Society of Civil Engineers; Hony Life Fellow (and past president), Institution of Engineers (India); Indian Geotechnical Society;

Awards and Honours: President's Gold Medal (Central Board of Irrigation and Power) (1964, 1965); K.F. Antia Prize (1973); Jawaharlal Nehru Gold Medal (Institution of Engineers, India); IISc Alumni Award (1987).

Lectureships: Fondation Day Lecture (Institution of Engineers, India, Dhanbad Centre) (1966); Nidhu Bhushan Ray Lecture (Institution of Engineers, India, Bombay) (1967).

Author/Editor Facet: Author of nine books including 'Design of Siphons' (1956), 'Hydraulics' (1962), 'Mechanics of Fluids' (1978); editor, *J. Instn. Engrs. (Civil Engng.)* (1962-65); member, panel of editors, *Hydraulic Res.*.

Policy-making Bodies: Adviser, Mangalore Port Project; Member, Central Board of Railway Research and its Civil Engineering , Hydroelectric Construction Projects; Consultant, Krishna Godavari Commission.

Address: 103, KT Apartments, 89, Diagonal Road, Visvesvarapuram, Bangalore 560 004.

RAO, Nandury Venkata Subba

Elected 1963

Born 8 November 1919
D.Sc., Andhra University, Waltair; Ph.D., University of London, UK

Specialization: Natural Products Chemistry

Research Achievements: Rao' significant contributions were in: (i) chemistry of natural products; (ii) synthesis of aromatic and heterocyclic compounds likely to be of value as insecticides, fungicides and bactericides; and (iii) mode of formation of heterocyclic nitrogen rings.

Positions: Professor and Head, Chemistry Department, Osmania University, Hyderabad.

Learned and Professional Societies: Fellow, Royal Institute of Chemistry (London), Chemical Society (London), Indian Chemical Society, and Indian Academy of Sciences.

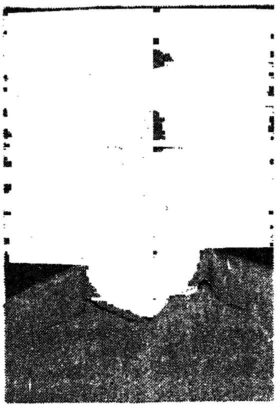
Other Contributions: Rao was responsible for establishing an active school of organic chemical research at Osmania University.

Died (Date N.A.)

RAO, Naropantal Appaji

Elected 1984

Born 25 September 1934; Madras, Tamil Nadu
Ph.D. (1959), University of Rajasthan, Jaipur



Specialization: Mechanisms of Enzyme Catalysis and Regulation, Inbreeding in Human Population

Research Achievements: Appaji Rao Established the mechanisms of regulation of plant aspartate transcarbamylase glutamine synthetase; elucidated the primary structure of serine hydroxymethyltransferase, and interaction at the active site of this enzyme. Disproved the misconception about the inbreeding in human population.

Positions: Professor (1980), Chairman (1989-92), Department of Biochemistry, Indian Institute of Science, Bangalore.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

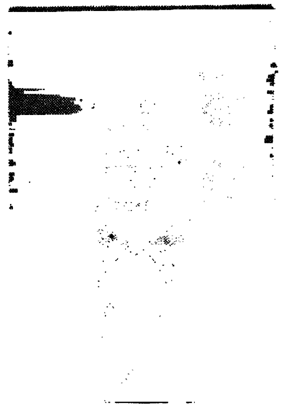
Awards and Honours: M. Sreenivasayya Memorial Award (1980), Jagadish Chandra Bose Medal (INSA) (1980).

Author/Editor Facet: Served on the editorial boards of: *Indian J. Biochem. Biophys., J. Biosci. Biotech., and Appl. Biochem.*

Address: Professor, Department of Biochemistry, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2310), 369561; Telex: 0845-8349; Fax: 91-80-341683; Res: E-23, Staff Quarters, IISc, Bangalore 560 012; Tel: (080) 369361.

RAO, Neelamraju Ganga Prasada

Elected 1979



Born 5 September 1927; Korisapadu,
Andhra Pradesh
Ph.D. (1968), Bihar University

Specialization: Plant Breeding & Genetics, Dryland Agriculture; Agricultural Research & Education.

Research Achievements: Rao has contributed to the development of concepts, methodologies and plant materials, leading to the transformation of the traditional subsistence dryland sorghums and sorghum-based cropping systems to more productive forms in India. Contributed to the development of the first commercial sorghum hybrids, which were released for cultivation in India. His work has also covered pulses, cotton and oilseeds.

Positions: Chairman, Agricultural Scientists Recruitment Board, ICAR (1984-87); Vice-Chancellor, Marathwada Agricultural University; Professor of Eminence, ICAR; ICRISAT'S Regional Sorghum Breeder and Visiting Professor, Ahmadu Bello University, Saman-Zaria, Nigeria (1980-83); Project Coordinator, All India Sorghum Improvement Project, IARI Regional Station, Hyderabad (1970-80); Project Coordinator (1967-70), Sorghum Botanist and Associate Project Coordinator (1961-70), Indian Agricultural Research Institute, New Delhi.

Learned and Professional Societies: Fellow, National Academy of Sciences (India) and Andhra Pradesh Academy of Sciences; President, Indian Society of Genetics and Plant Breeding; Member, New York Academy of Sciences.

Awards and Honours: C. Subramaniam Individual Award (Gold Medal) (1966); Shanti Swarup Bhatnagar Prize (1967); Government of Andhra Pradesh Award (1970); Rafi Ahmed Kidwai Memorial Prize (1978); National Tonnage Club of Farmers Award (1975-76); Memento by Governor of Andhra Pradesh (1976); Jenna Reddy Venkat Reddy Prize (1976); Memento by Karshak Samaj (1978); VASVIK Award (1979); Silver Jubilee Award (Andhra Pradesh Academy of Science) (1988); Golden Jubilee Award (Indian Society of Genetics and Plant Breeding).

Author/Editor Facet: Co-edited a symposium volume 'Sorghum in Seventies' (Oxford & IBH).

Address: HIG (OG), Block 10, Flat 4, Bagh Lingampalli, Hyderabad 500 044.

RAO, Palle Rama

Elected 1980

Born 30 June 1937; Kurnool, Andhra Pradesh
Ph.D. (1964), Banaras Hindu University, Varanasi

Specialization: Physical & Mechanical Metallurgy

Research Achievements: Rama Rao's research achievements are principally in two areas of physical metallurgy, namely (i) X-ray diffraction study of structural imperfections and (ii) correlation of mechanical behaviour with microstructures. His notable contributions in X-ray studies include development of new methods of analysis of X-ray line- broadening and prediction and experimental verification of fault configurations in double hexagonal close-packed crystals. In regard to (ii) his achievements relate to high strain fatigue at ambient and elevated temperatures, creep at low (mass transport controlled) and intermediate (dislocation climb controlled) stresses, creep fracture and the effect of thermomechanically induced substructure on dynamic strain ageing and creep. He has also made novel studies on tensile deformation and fracture characteristics of titanium and its alloys. A major research programme, in which he was involved, addressed the basic issue of fracture toughness in single phase and dilute alloys. Much of his recent and curent work is devoted to alloy development with a view to ensure their application. Major contributions relate to development and application of speciality structural steels.

Positions: Secretary, Department of Science & Technology, New Delhi; Secretary, Department of Ocean Development, New Delhi; Hony Professor, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore; Director, Defence Metallurgical Research Laboratory, Hyderabad; Professor of Metallurgy, Banaras Hindu University, Varanasi.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Foreign Member, The Royal Academy of Engineering, UK, Andhra Pradesh Academy of Sciences and Indian National Academy of Engineering; Member, INSA Council (1985-87).

Awards and Honours: Pandya Memorial Medal (1964); Kamani Gold Medal (1970); National Associate (UGC) (1971); National Metallurgists Day Award (1973); Shanti Swarup Bhatnagar Prize (1979); Homi J. Bhabha Award (1985); UGC National Lecturer (1986); VASVIK Award (1986); INSA Prize for Materials Sciences (1989); National Citizen's Award (1990); Distinguished Alumnus Award (IISc) (1990); Tata Gold Medal (1992); Padma Shri (1989).

Author/Editor Facet: Chief editor (till 1987), *Trans. Indian Inst. Metals*, editor, *Bull. Mater. Sci.*, associate editor *Mater. Sci. Engng.*, member, editorial board, *Int. J. Press. Vess. Piping* (till 1992), *Bull Mater. Res. Soc.*, *Int. J. Fatigue*, member, international advisory board, *High Temp. Technol.*

Address: Secretary, Department of Science & Technology, Technology Bhawan, New Mehrauli Road, New Delhi 110 016; Tel: (011) 661439, 660068 (Off); (011) 382388 (Res); Telex: 31-73280, 31-61805 DST IN; Fax: 91-11-6862418, 6863847; E-mail: Shakti!Vikram!Tifac!Prr

RAO, Paranandi Venkata Suryanarayana *Elected 1983*

Born 17 July 1936; Berhampur, Orissa
Ph.D. (1961), University of Bombay

Specialization: Speech Research & Computer Architecture

Research Achievements: Rao developed TIFRAC, India's first electronic computer, ILLIAC II of the University of Illinois, and OLDAP, the first Indian computer. As Project director, he brought to fruition two major inter-organizational classified projects: (i) automatic data-handling for air defence involving joint participation of a number of research and development and production organizations in the country and (ii) an automatic electronic switch. He has also done research on speech synthesis and recognition.

Positions: Senior Professor & Head, Computer Systems & Communications Group (1990-), Professor (G) & Head, Computer Systems & Communications Group (1980-90); Professor & Head, Speech and Digital Systems Group (1978-83); Project Director, Sponsored Project (1972-84), and Senior Research Scientist, Computer R&D Group (1972-78), all at Tata Institute of Fundamental Research, Bombay.

Learned and Professional Societies: Fellow/Member, Indian Academy of Sciences, Acoustical Society of India, National Academy of Sciences (India), Institution of Electronic and Electrical Engineers (USA), Institution of Electronics and Telecommunication Engineers (India), and IAPR.

Awards and Honours: Vikram Sarabhai Award (1976); Om Prakash Bhasin Award (1987); VASVIK Award (1987); Padma Shri (1987).

Author/Editor Facet: Edited four books: 'An Introduction to Computer Programming in FORTRAN and other Languages' (Tata McGraw-Hill) (1980); 'Data Conversion Principles, Chapter II', (John Wiley & Sons); 'BASIC Elementary, Standard and Enchanced' (Macmillan India Ltd., 1989) and 'Trends in Computer Architecture: An Indepth Perspective' (Prentice-Hall of India Pvt. Ltd., 1991); Advisory Member, Editorial Committee, *IEICE Trans. Fundament. Electron., Commun. Comput. Sci.*, Japan.

Policy-making Bodies: Member, Governing Council, Indian Statistical Institute; Telecommunications, R&D Council and Telecommunication Commission, Ministry of Communications.

Other Contributions: Advised on the organization of computer science teaching programmes at postgraduate level at several official committees; concerned with evolution of R&D programmes in computers, solid-state electronics and related fields. As member of the Technology Development Council of the Electronics Commission, Chairman of Working Group on Computers and director on the board of Computer Maintenance Corporation Ltd., he has also been responsible for implementation of this policy.

Address : Head, Computer Systems & Communications Group, Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Bombay 400 005; Tel: (022) 2152971/4/9 (Extn 339); Telex: 011- 083009 TIFR IN; Fax: 91-22-2152110/2152181; E- mail: shakti!tifr!csc01 (for India), rao@tifrvax.bitnet (for overseas countries); Res: 701, Meghnad, TIFR Quarters, Colaba, Bombay 400 005; Tel: (022) 2152400.

RAO, Patcha Ramachandra

Elected 1985

Born 21 March 1942; Kavutavaram, Andhra Pradesh
Ph.D. (1968), Banaras Hindu University, Varanasi

Specialization: Physical Metallurgy, Materials Science, Thermodynamics of Alloys

Research Achievements: Rao is responsible for the establishment and development of basic research and technology in the field of rapid solidification of metals and alloys in India. He has studied a large number of metastable alloys and elucidated the mechanisms of their formation. Discovered several new metastable phases including a new class of quasi-crystals. Contributed to the understanding of the thermodynamics of associated solutions and glasses.

Positions: Director, National Metallurgical Laboratory, Jamshedpur (1992-); Professor of Materials Science, (1981- 92), Reader in Physical Metallurgy (1972-81), Banaras Hindu University, Varanasi.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Indian National Academy of Engineering; Life Member, Indian Institute of Metals, Electron Microscope Society of India, Indian Society for Advancement of Materials and Process Engineering and Materials Research Society of India; Member, Materials Research Society (USA).

Awards and Honours: National 'Metallurgists' Day Award (1979); Platinum Jubilee Commemorative Silver Medallion (Indian Institute of Science); Intercosmos Medal (USSR) (1984); Shanti Swarup Bhatnagar Prize (1985); Malaviya Memorial Trust Senior Academic Award (BHU) (1985); UGC National Lecturer.

Lectureships: Platinum Jubilee Lecture (Indian Science Congress) (1993).

Author/Editor Facet: Member, editorial advisory boards of: *Bull Mater. Sci.*, *Sadhana*, *Int. J. Rapid Solidif.*; guest editor, *Bull. Mater. Sci.* (for two issues).

Policy-making Bodies: Member, International Advisory Committee for International Conferences on Rapid Quenching of Metals, Germany (1985), Canada (1988), Sweden (1991); and several other Indian bodies.

Address: Director, National Metallurgical Laboratory, P.O. Burmamines, Jamshedpur 831 007; Tel: (0657) 310131/26097; Telex: 0626-210/274 NMLJ IN; Fax: 91-657-26527; Res: 45, Circuit House Area, Jamshedpur 831 001; Tel:(0657) 23864.

RAO, Potukuchi Suryaprakasa

Elected 1968

Born 1 September 1914; Rajahmundry,
Andhra Pradesh
D.Sc. (1941), Andhra University, Waltair

Specialization: Natural Products Chemistry, Plant Biochemistry

Research Achievements: Rao worked on flower pigments while at the Andhra University. At Forest Research Laboratory, he carried out investigations on the chemistry and utilization of several forest products like dyes, drugs, essential oils, fatty oils, carbohydrates, proteins and tannins. He and his coworkers studied the spike disease of sandal and worked out methods for its control, including treatment with antibiotics. He was largely responsible for the development of the tamarind kernel powder industry in the country to get over the problem of the shortage of cereal starches for sizing and finishing in cotton and jute textile industries.

Positions: Professor, Department of Chemistry, Sri Sathya Sai Institute of Higher Learning, Bangalore; ICAR Retired Scientist, Indian Institute of Horticultural Research, Bangalore; Director, Forest Research Laboratory, Bangalore (till 1973); Head, Chemistry of Forest Products Branch, Forest Research Institute, Dehra Dun (1956-60).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Royal Institute of Chemistry (London), Indian Academy of Wood Science, and Indian Academy of Horticultural Sciences; Member, Indian Phytopathological Society and American Wood Preservers Association; Founder Member, Tree and Wood Chemistry Group of International Union of Forestry Research Organizations.

Author/Editor Facet: Co-authored 4 books: 'Industrial Gums' (Academic Press, 1959, revised 1972), 'Some Useful Aromatic Plants' (Government of India, 1966), 'Handbook on Indian Woods and Wood Panels', and 'Aromatic Plants of India'.

Address: Res: "Sai Nilaya" 1-A Cross, Gangenahalli Extension, Bangalore 560 032; Tel: (080) 335751.

RAO, Salem Ramachandra Rao Venkatasubba

Elected 1983

Born 27 December 1927; Nagamangala, Karnataka
Ph.D. (1958), University of Rajasthan

Specialization: Cytogenetics and Cell Biology

Research Achievements: The discovery of dosage compensation mechanism in two crickets, *Gryllotalpa fossor* (mammalian type) and *Acheta domesticus (Drosophila* type), suggests its ancient origin. He and his coworkers' research on the nature of constitutive heterochromatin (c.h.) points to the conclusion that it is not a dispensable genomic entity (rodent, *Nesokia*). Evidences from *Gryllotalpa* suggest that c.h. has remained in a transient stage in its molecular evolution without cytological manifestation.

Positions: Professor (reappointed on superannuation), (1988- 92), Professor (formerly Head), Department of Zoology, University of Delhi (1978-87); Visiting Senior Scientist, Medical Research Council, UK (1985-86).

Learned and Professional Societies: Fellow, National Academy of Sciences (India); President, Indian Society of Cell Biology (1989-90).

Awards and Honours: UGC National Lecturer (1986-87); J.C. Bose Award (Hari Om Ashram-UGC) (1987).

Lectureships: Dr Salim Ali Memorial Lecture (UGC; Aligarh Muslim University) (1993).

Address: F-90, Sector 21, Jal Vayu Vihar, Noida 201 301, Uttar Pradesh.

RAO, Salgame Ranganna Narayana

Elected 1951

Born 5 December 1897; Bangalore, Karnataka
M.A. (1922), University of Madras

Specialization: Geology, Palaeogeology, Palaeobotany

Research Achievements: Rao did research on the Chamundi granite and associated rocks around Mysore. The micropalaeontological studies, he carried out, of the infra- and intertrappean beds of the Deccan trap in the Rajahmundry area led to the discovery of many algal species including numerous Charophytes. On the basis of the evidence of these microfossils he ascertained the age of Deccan traps. Discovered certain well-preserved Orbitoids in one of the limestones of the Ariyalur group near Chokanadapuram. The discovery of Orbitoids, which constitute an important group of foraminifers especially valuable in the study of Cretaceous stratigraphy, marked the starting point for further investigations in this area.

Positions: Lecturer, Geology Department, University of Mysore; Reader, Professor and Head of Geology Deparatment, University of Lucknow; Hony Assistant Director, Palaeobotanical Institute (now Birbal Sahni Institute of Palaeobotany), Lucknow; Hony Director, Department of Geology and Mining, Uttar Pradesh.

Learned and Professional Societies: Founder Member, Palaeontological Society of India; Foundation Fellow, Geological Society of India.

Other Contributions: Built up an active school of micropalaeontological research with special reference to fossil algae and foraminifers, which were his own field of specialization.

Died 9 October 1971.

RAO, Subbarao Ramachandra

Elected 1948

Born 15 May 1899; Mannargudi, Tamil Nadu
D.Sc. (1937), University of London, UK

Research Achievements: Rao's achievements relate to: (i) anisotropy of the polarization field in liquids by a study of light scattering in liquids at high temperatures; (ii) comparative studies on soft X-ray emission and secondary electron emission from polycrystalline and single-crystal metal faces; and (iii) magnetic properties of some elements and compounds in amorphous, colloidal, single-crystal and dissolved states.

Positions: Reader and Professor of Physics, Annamalai University, Annamalai Nagar (1930-43); Professor of Physics, Central College, Bangalore (1943-54) and Sri Venkateswara University, Tirupati (1954-63).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Institute of Physics (London), and National Academy of Sciences (India).

Awards and Honours: President, Physics Section, Indian Science Congress (1952).

Died 28 February 1983.

RAO, Thammajirao Ramachandra

Elected 1957

Born 9 October 1907; Mysore, Karnataka
D.Sc. (1951), University of Calcutta

Specialization: Malariology, Entomology

Research Achievements: Ramachandra Rao's research spanned mosquitoes of India, with special reference to anophelines; measures for controlling of rural malaria and demonstration of its utility; epidemiology of vector-borne diseases with special reference to malaria, and viruses; and behaviour and morphology of chromosomes of grasshoppers.

Positions: Director, Virus Research Centre, Pune (1961-70); Officer on Special Duty, Indian Council of Medical Research, New Delhi (1970-73).

Learned and Professional Societies: Fellow, National Academy of Medical Sciences (India), National Society of Communicable Diseases (India), Royal Society of Tropical Medicine and Hygiene and (London); Hony Member, American Society of Tropical Medicine and Hygiene.

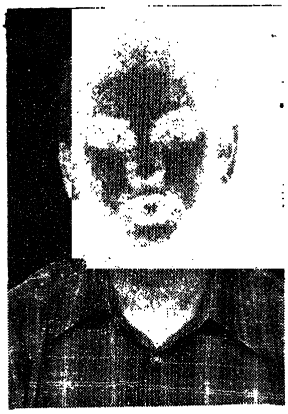
Awards and Honours: President, Zoology Section, Indian Science Congress (1972); Sisir Kumar Mitra Lecture Award (INSA) (1978).

Lectureships: Sharada Devi Paul Memorial Oration (National Institute of Virology); T.S. Narayana Rao Oration Award (ICMR) (1974).

Died 8 November 1984.

RAO, Udipi Ramachandra

Elected 1979



Born 10 March 1932; Admar, Karnataka
Ph.D. (1960), Gujarat University; D.Sc. (*h.c.*) from 7 universities

Specialization: Space Physics

Research Achievements: Besides contributing to the understanding of the interplanetary physics, high energy astronomy, Rao is responsible for establishing satellite technology in India. He was the Project Director for India's first satellite Aryabhata and guided the development of the operational Indian Remote Sensing Satellite (IRS) and INSAT-2 communication satellite series. He is instrumental in the transition of the Indian Space Programme from experimental to operational phase, providing vital Space services. As ISRO Chairman, he has been responsible for the rapid development of rocket technology, resulting in the total development of ASLV and PSLV rockets. The GSLV geostationary launch vehicle, now under development, can launch 2.5-ton INSAT class of satellites into the geostationary orbit which will make India totally self reliant in rocket technology. Because of the thrust, space technology has now become an extremely important catalyst for the development in the areas of communication, TV broadcast, education, management of natural resources, and initiation of sustainable integrated development.

Positions: Chairman, Space Commission; Secretary to the Government of India, Department of Space; Chairman, Indian Space Research Organization (1984-); Director, ISRO Satellite Centre, Bangalore (1976-84); Project Director, Aryabhata Satellite Project (1972-76); Head, Satellite Systems Division, Vikram Sarabhai Space Centre, Thiruvananthapuram (1972); Professor, Physical Research Laboratory, Ahmedabad (1966-71).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Indian Academy of Engineering, Institute of Electrical and Electronics Engineers (USA), and Indian Aero- Medical Society.

Awards and Honours: Karnataka Rajyothsava Awards (1975, 1983); Hari Om Vikram Sarabhai Award (1975); Shanti Swarup Bhatnagar Prize (1975); National

Design Award (1980); P.C. Mahalanobis Medal (INSA) (1987); Group Achievement Award from NASA (1973); USSR Medal of Honour (1975); Yuri Gagarin Medal (USSR) (1991); Allan D. Emil Memorial Award (International Astronautical Federation) (1992); Padma Bhushan (1976).

Lectureships: IAEC Endowment Lecture (1975); Dr Y. Nayudamma Memorial Lecture (1988); Vikram Sarabhai Memorial Lecture (Indian Society of Remote Sensing) (1991); Prince Mukkarramjah Endowment Lecture (Indian Geophysical Union) (1991); IETE Solidaire Endowment Lecture (1991); Professor Brahm Prakash Memorial Lecture (1992); Professor S. Bhagavantam Memorial Lecture (1992); Jawaharlal Nehru Memorial Lecture (1992).

Author/Editor Facet: Edited/co-edited six books/volumes.

Policy-making Bodies: Vice-President, International Astronautical Federation; Chairman, Committee for Liaison with Developing Nations.

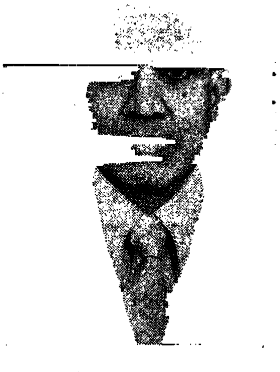
Address: Chairman, Space Commission/Secretary, Department of Space, Antariksh Bhavan, New BEL Road, Bangalore 560 094; Tel: (080) 331181, 334241; Telex: 0845-2499, 0845-2326; Fax: 91-80- 333328; Res: 3367-E, 13th Main, HAL II Stage, Indiranagar, Bangalore 560 038; Tel: (080) 569523.

RAO, Vallurupalli Sita Raghavendra

Elected 1981

Born 1 February 1931
Ph.D. (1960), Osmania University, Hyderabad

Specialization: Biopolymers



Research Achivements: Rao is a specialist in carbohydrate structure and, in particular, the conformation and activity of polysaccharides and related biomaterials. In 1967 he was the first to develop methods for investigating the structures of oligosaccharides and long-chain polysaccharides by using the idea of dihedral angles and of the bonds meeting at the bridge oxygen. He has since worked on: (i) mechanism of action of penicillin, (ii) conformation of complex polysaccharides and peptidoglycan, (iii) stereochemistry of pyranose sugars and derivatives, (iv) conformations of ordered polysaccharides, and (v) conformation of random polysaccharides. The most significant among Rao's contributions are the studies on cell-wall polysaccharides and the action of antibiotics, like pencillin and cephallosporin on them, leading to an extremely satisfactory theory of the mode of action of the antibiotics, and of their resistance to degradative enzymes.

Positions: Professor, Indian Institute of Science, Bangalore (1974-); Reader in Biophysics, University of Madras (1974- 1973).

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: Sir J.C. Bose Award (1977).

Author/Editor Facet: Co-authored 'Conformational Analysis of Polysaccharides' (Plenum Press).

Address: Professor, Molecular Biophysics Unit, Indian Institute of Science, Bangalore 560 12; Tel: (080) 344411 (Off), (080) 343024 (Res).

RASTOGI, Raghunath Prasad

Elected 1975

Born 4 June 1926; Lucknow, Uttar Pradesh
Ph.D. (1952), University of Lucknow

Specialization: Thermodynamics; Propulsion and Combustion Chemistry

Research Achievements: Rastogi has made significant theoretical and experimental contributions in linear thermodynamics of irreversible processes with special reference to electrokinetic, electrophoretic and thermo- osmotic phenomena and Dufour effect, along with equally significant contributions in nonlinear steady-state electrokinetic phenomena. He has made important contributions in far-from equilibrium phenomena (oscillatory reactions, electrokinetic oscillations, pattern formation in chemical reactions, crystal growth and electrodeposition) from the angle of non-linear dynamics. Also made contributions in thermodynamics and thermochemistry of eutectic mixtures, addition compounds (including kinetics and diffusion mechanism of solid- solid reaction for compound formation) and contributions on burning rate, ignitability and mechanism of combustion of composite solid, liquid and hybrid propellants.

Positions: CSIR Emeritus Scientist, Central Drug Research Institute, Lucknow (1991-); Vice-Chancellor, Banaras Hindu University (1985-91); Professor and Head, Chemistry Department, Gorakhpur University (1962-85).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India).

Awards and Honours: Khosla National Award (1974); FICCI Award (1975); Meghnad Saha Award (UGC) (1982); Professor Palit Memorial Award (1985); Professor S. Swaminathan 60th Birthday Commemoration Lecture Award (INSA) (1992).

Author/Editor Facet: Served as member of editorial boards of: *Indian J. Chem. Indian J. Technol.*; presently member, editorial board of *J. Membrane Sci.* (USA).

Address: Emeritus Scientist (CSIR), Medicinal Chemistry Division, Central Drug Research Institute, Lucknow 226 001; Tel: (0522) 232411-18 (Ext 4381); Telex: 0535-286; Fax: 91-0522-243405; Res: 295/281 Ka, Asherfabad, Lucknow 226 003; Tel: (0522) 62638.

RASTOGI, Ram Gopal

Elected 1982

Born 26 December 1929; Allahabad, Uttar Pradesh
Ph.D. (1956), Gujarat University, Ahmedabad

Specialization: Geomagnetism and Aeronomy

Research Achivements: Rastogi has been responsible for successful installation and operation of ionospheric research stations at Ahmedabad and Thumba. Organized ionospheric research projects with the joint collaboration with number of universities to study ionospheric drifts, electron content and scintillations and other aspects of upper atmosphere. Responsible for organizing All India Coordinated Programme (DST) on Ionospheric Thermospheric Studies. Conducted one of the most sophisticated satellite radio propagation experiments at Ootacamund during ATS-6 period in 1975-76. Introduced number of research programmes on upper atmosphere and solid earth studies transforming the institute into an important research centre in India. His earlier contributions were on the various morphological aspects of the ionosphere at equatorial and low latitudes. He was first to show intimate relationship between the geomagnetic field and the equatorial ionosphere. In geomagnetic field, he was first to discover the longitudinal variation of equatorial electrojet and the reversal of electric field during counter electrojet, the effect of interplanetary magnetic field on equatorial electrojet and many other features of electrojet current. His group has number of original contributions on ionospheric irregularities like sporadic E and spread F and their role in satellite radio propagation effect, scintillations, Faraday rotation, dispersion etc.

Positions: Director, Indian Institute of Geomagnetism (IIG), Bombay (1980-89); Associate Professor and Professor, Physical Research Laboratory, Ahmedabad (1962-80); Senior Research Associate, (US) Air Force Geophysics Laboratory, Massachusetts (1977-80); Visiting Professor, University of Texas at Dallas, USA (1974) and at University of New South Wales, Sydney, Australia (1992).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Association of Exploration Geophysicists and National Academy of Sciences (India).

Awards and Honours: Hari Om Ashram Award (Gujarat University) (1977); Japanese Geophysical Society Medal (1985); USSR Academy of Sciences Commemoration Medal (1984).

Policy-making Bodies: Member, Executive of International Association of Geomagnetism and Aeronomy (IAGG); Chairman, Commission for Developing Countries.

Other Contributions: Played a significant role in building up PRL and IIG as a centre for the study of ionosphere, aeronomy and geomagnetism.

Address: CSIR Emeritus Scientist, Physical Research Laboratory, Navrangpura, Ahmedabad 380 009; Tel: (0272) 462129; Res: 51, Spring Field, Vastrapur, Ahmedabad; Tel: (0272) 467807.

RATNASAMY, Paul

Elected 1987

Born 11 June 1942; Madras, Tamil Nadu
Ph.D. (1968), University of Madras

Specialization: Catalysis

Research Achievements: Ratnasamy's focus of research is identification, structure elucidation and activity determination of catalysts. He has shown, for the first time, correlation in the acidic and catalytic properties of ZSM-5 zeolites in xylene isomerization. Synthesized a novel ferrosilicate zeolite, and assessed its application potential. He holds 56 patents, six of them in the USA.

Positions: Scientist (Director's grade), National Chemical Laboratory, Pune.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India) and Catalysis Society of India; Member, Council of International Zeolite Association..

Awards and Honours: Shanti Swarup Bhatnagar Prize (1984); VASVIK Award; K.G. Naik Gold Medal; Bangur Award (Bharat Chamber of Commerce).

Author/Editor Facet: Member, editorial board of *Zeolites*; served on editorial board of *Indian J. Technol.*

Address: Deputy Director, National Chemical Laboratory, Pune 411 008; Tel: (0212) 334761; Res: B-2, NCL Colony, Pune 411 008; Tel: (0212) 333906.

RAY, Amar Prasad

Elected 1962

Born 26 February 1913; Calcutta, West Bengal
Ph.D. (1956), University of Patna

Specialization: Malariology

Research Achievements: Ray's research has covered acute and chronic malaria, nutrition, chemotherapy, parasitology and biochemistry.

Positions: Chief Coordinator, PFCP (WHO/SIDA) (1978); Director, Malaria Research Unit, RAAMC, Sydney, Australia (1973-77); Senior Regional Malaria Adviser (WHO) (1967-70); Deputy Director- General, Public Health (1962-66); Director, National Malaria Eradication Programme (1959-67); Deputy Director, Malaria Institute of India (now Malaria Research Centre), Delhi (1956- 59).

Learned and Professional Societies: Fellow, National Academy of Medical Sciences (India), Royal Society of Tropical Medicine and Hygiene (London), and National Society for Malaria and Communicable Diseases; Member, Indian Public Health Association.

Awards and Honours: WHO-Darling Foundation Award (RAAMC, Australia) (1974); Geoffery Harkness Award (1977); B.C. Das Gupta Oration Award (1981); Padma Shri (1967).

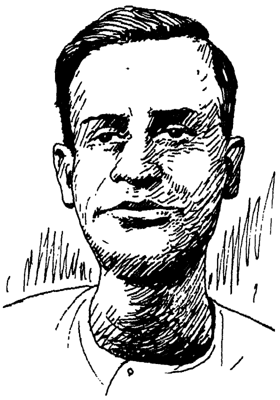
Address: 240 Kailash Hills, East of Kailash, New Delhi 110065; Tel: (011) 6831629.

RAY, Bidhu Bhusan

Elected 1935

Born July 1894
D.Sc. (1922), University of Calcutta

Specialization: Physics, X-rays



Research Achievements: Ray's doctorate thesis on scattering of light brought him great reputation. His findings had an important bearing on the colouring of glasses by suspended metal particles and the axial colours exhibited by clouds. His investigations at the laboratories of Manne Sieghahn (Uppsala, Sweden) and Niels Bohr (Copenhagen) contributed significantly to the revision of a theory on the origin of X- ray spectra. He was able to establish that the spectra are actually modified by chemical combination. He studied the emission and absorption spectra of elements in the soft X-ray region, which shed light on the distribution of electrons in the solid state. From the theory of the fine structure of X- ray absorption edges, he obtained interesting results on the nature of ions in a solution.

Positions: Bengal Civil Service. Professor of Physics, Khaira Professor of Physics, University College of Science and Technology, Calcutta.

Learned and Professional Societies: Founder Member, Indian Science News Association.

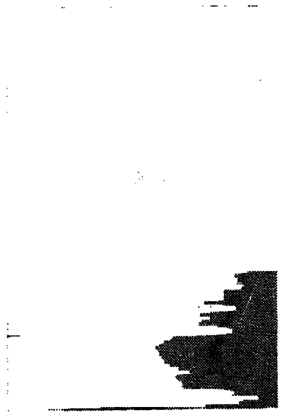
Awards and Honours: President, Physics Section, Indian Science Congress (1942).

Author/Editor Facet: Edited *Sci. & Cult.*

Died 29 July 1944.

RAY, Harendra Nath

Elected 1950



Born 31 January 1899; Meerut, Uttar Pradesh
Ph.D. (1930), University of London, UK

Specialization: Parasitology

Research Achievements: An eminent parasitologist, Ray was widely recognized for his researches on parasitic protozoa. He discovered a number of new genera and species in Rhizopoda, Mastigophora, Cilliophora, Gregaria, Coccidia and Haemosphoridia. He researched on the systematics and bionomics of a good number of parasitic protozoa in odd types of hosts. Discovered several sporozoan species in polychaeate worms, millipedes, intestinal amoeba of an ascidian, a coocidian form in the eggs of *Thalesemma neptuni* etc. Developed the stillamidine test for the detection of the latent trypanosomal infection in zebra cattle, buffaloes and in camels. He was a pioneer to establish the method of transmission of *Theilaria annulata* in cattle through the eggs of infected ticks, *Hyaloma saisgnyi*. His discovery of the presence of small cysts clusters in the liver of the Himalayan giant flying squirrels depicting the exoerythrocytic schizogony of a malarial parasite, referred to as a genus *Rayella,* won him international repute. He made notable contributions to the study of the malarial parasite.

Positions: Research Officer (Protozoology) and Head, Parasitology Division, Indian Veterinary Research Institute, Mukteswar (1936- 54); Professor of Protozoology, Calcutta School of Tropical Medicine, Calcutta (1954-65); Research Scientist (ICAR), Department of Zoology, Presidency College, Calcutta; Emeritus Scientist (ICMR) and Retired Scientist, CSIR (1965-69).

Learned and Professional Societies: Fellow, Royal School of Tropical Medicine and Hygiene, American Society of Parasitologists, and Zoological Society (Calcutta), and Zoological Society of India (sometime President).

Awards and Honours: Joygobinda Law Memorial Medal (Asiatic Society) (1956); President, Zoology and Entomology Section, Indian Science Congress (once); Sectional President, Third International Congress of Protozoology, Leningrad.

Died 30 May 1969.

RAY, Jnanendra Nath

Elected 1935

Born 17 February 1897; Tilli, Bangladesh
D.Sc. (1934), University of Manchester, UK

Specialization: Organic Chemistry, Pharmacology

Research Achievements: Ray pioneered work on alkaloids, anaesthetics and chromatography. Apart from his contribution to pharmacology and organic chemistry, he did work on steroids at the University of Bombay.

Positions: Professor of Pharmacology and Chemistry, University of Panjab, Lahore; Director, Drugs and Dressings, New Delhi; Technical Adviser, Planning Department, Government of India; Hony Professor of Chemistry, University of Bombay; Adviser, Calcutta Chemicals, Calcutta.

Learned and Professional Societies: Fellow, Indian Chemical Society (President) and Royal Institute of Chemistry (London) (President, Indian Branch).

Awards and Honours: OBE; President, Chemistry Section, Indian Science Congress (1937).

Died 9 April 1970.

RAY, Jyotis Chandra

Elected 1948

Born 20 April 1899; Narottampur, Bangladesh
M.D., University of Berlin, Germany

Specialization: Microbiology, Medicine and Diseases

Research Achievements: Ray's initial work related to septicaemic and enterotropic characteristics of cholera vibrio, significance of bile in the passage of cholera vibrios from blood to intestinal walls, and oral immunization against cholera. He also worked on important problems like the cultivation and differential diagnosis of various leishmania parasites on solid medium, cultivation of other blood flagellates, serology in leishmaniasis and the leishmania, tropical vaccine for the treatment of oriental sore. In addition, he conducted investigations on malarial immunity, cultivation of *Entomoeba histolytica,* typhoid, cholera, bowel disorders in Bengal, and Oriel's urinary proteose in the treatment of allergic diseases.

Positions: Officer-in-Charge, Protozoological Survey, Central Research Institute, Kasauli, Shimla Hills; Associate Director and Director, Indian Institute of Medical Research, Calcutta.

Learned and Professional Societies: Member, Council (1959-60; 1969-70) and Vice President, INSA (1967-68), Member, Indian Medical Association and Biochemical Society of London.

Awards and Honours: Padma Bhushan (1968)

Lectureships: Mahendra Lal Sarkar Memorial Lecture (Indian Association for the Cultivation of Science) (1969).

Author/Editor Facet: Ray was a great organizer of medical research. He had a role to play in founding *Ann. Biochem. Exp. Med.*

Died 23 November 1975.

RAY, Manohar

Elected 1958

Born 14 February 1908
D.Sc. (1939), University of Calcutta

Specialization: Applied Mathematics

Research Achievements: Ray's researches were concerned with the flow of fluids, theories of turbulence and flow of compressible fluids. He produced an ingenious solution of the motion of a circular disc by making use of the discontinuous integrals of Weber and Schafheithion and found that the drag for broadside motion is one-and-a half times that for edgeways motion.

Positions: Post-graduate Lecturer, F.C. College, Lahore (1936- 43); Professor and Head, Mathematics Department (1943- 59), Registrar (1959-60) and Principal (1960-1970), Agra College, Agra.

Learned and Professional Societies: Fellow, National Academy of Sciences (India).

Awards and Honours: President, Mathematics Section, Indian Science Congress (1958-59).

Died 8 January 1977.

RAY, Naba Kishore

Elected 1986

Born 5 December 1940; Cuttack, Orissa
Ph.D. (1968), Indian Institute of Technology, Kanpur

Specialization: Theoretical Chemistry

Research Achievements: Ray employed the simple molecular orbital theory to study the properties and molecular electronic structures, electron spin resonance hyperfine splittings and transition states of hydroboration and diboration reactions. He modified the FSGO model of Lewis and Langmuir by introducing various model potentials to simulate the core. The modification in conjunction with the fragment orbital approach has made the model suitable for the study of larger systems. Ray's most interesting work is the molecular orbital study of surface- adsorbate interaction. He predicted the behaviour of CO on the surfaces of pure Pt, Pt anode and cathodic Pt (i.e. Pt with pre- adsorbed K) using the simple molecular orbital method.

Positions: Chairman, Department of Chemistry, University of Delhi.

Learned and Professional Societies: Fellow, National Academy of Sciences (India), and International Society of Quantum Biology and & Pharmacology.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1983).

Author/Editor Facet: Member, editorial board, *Indian J. Chem.*

Other Contributions: Founder Director, Centre for Professional Development in Higher Education, University of Delhi.

Address: Professor, Department of Chemistry, University of Delhi, Delhi 110 007; Tel: (011) 7257725 (Ext 325); Fax: 91-11-352471; Res: C-7 (29/31), Probyn Road, University of Delhi Campus, Delhi 110 007; Tel: (011) 7257855.

RAY, Prafulla Chandra

Foundation Fellow

Born 2 August 1861; Jessore, Bangladesh
D.Sc. (1887), University of Edinburgh, UK; D.Sc. (*h.c.*), University of Durham, UK

Research Achievements: Ray cherished a desire for applying chemical knowledge to the welfare of the country through the development of chemical industries. With his undaunted efforts, as well as savings from his salaries and locally available raw materials, sprang up the Bengal Chemical and Pharmaceutical Works Ltd. The first piece of work of Ray which brought him recognition was the isolation of mercurous nitrite in 1896. He later turned his attention to the study of compounds of metallic elements with organic sulphur derivatives, particularly mercaptans and sulphides. He and his coworkers prepared number of double sulphates of triethyl and trimethyl sulphonium bases with metals of the copper-magnesium group. Similar double salts with phosphonium bases were also prepared. Furthermore, they prepared and characterized a number of compounds of zinc, cadmium and mercuric iodides as well as antimony halides with alkyl sulphonium iodides.

Positions: Assistant Professor (1889), Professor of Chemistry, Presidency College, Calcutta; Palit Professor of Chemistry, University College of Science, Calcutta.

Learned and Professional Societies: President, Indian Chemical Society.

Awards and Honours: Hope Prize (University of Edinburgh).

Other Contributions: The monumental work 'History of Hindu Chemistry' bears testimony to Ray's love for the study of history and literature, history of science in general and history of chemistry in paticular. Ray earned the honorofic *Acharya* for his service and sacrifice for science, society and cause of chemical industry in India. He inspired a generation of young chemists in India, thereby building up an Indian School of Chemistry, for which he is aptly called, 'the Father of Indian Chemistry'.

Died 16 June 1944.

RAY, Priyada Ranjan

Foundation Fellow

Born 16 January 1888; Noapara, Bangladesh
M.A. (1911), University of Calcutta; D.Sc. (*h.c.*) from Calcutta, Jadavpur and Burdwan Universities

Specialization: Inorganic and Analytical Chemistry

Research Achievements: Ray carried out intensive research in inorganic, analytical and nuclear chemistry as a result of which he introduced useful analytical reagents for volumetric, gravimetric and spectrophotometric analysis of metals. His contributions to coordination complexes are highly significant; established, for the first time, the isomerism of thiosulphuric acid. He was acknowledged as an authority on complexes, valency and microchemistry, and a pioneer of magnetochemistry in India. Using the radioisotope ^{128}I, he proved that there is no essential difference between normal covalency and coordinate covalency.

Positions: Professor of Chemistry, City College, Calcutta (1919); Assistant Palit Professor of Chemistry, University College of Science; Khaira Professor (1937), Palit Professor and Head (1952), Department of Chemistry; Hony Professor, and Director (1956-58), Indian Association for the Cultivation of Science (IACS), Jadavpur.

Learned and Professional Societies: President (1947-48), Indian Chemical Society; President, Indian Science News Association (1958-59); Member, INSA Council (1943-45).

Awards and Honours: President, Chemistry Section, Indian Science Congress (1932); Shanti Swarup Bhatnagar Medal (INSA) (1968).

Lectureships: P.C. Ray Memorial Lecture (Indian Chemical Society) (1954); Mahendra Lal Sircar Memorial Lecture (IACS) (1960); J.C. Ghosh Memorial Lecture (Indian Chemical Society) (1963); Rajshekhar Bose Memorial Lecture, (Bangiya Vijnan Parishad) (1963); S.S. Bhatnagar Memorial Lecture (INSA) (1968); J.C. Bose Memorial Lecture (Bose Institute) (1971); Sivaprasad Chatterjee Memorial Lecture (Bangiya Vijnan Parishad) (1973).

Author/Editor Facet: Ray revised and enlarged Acharya P.C. Ray's book 'History of Hindu Chemistry' and updated it into 'History of Chemistry in Ancient and Medieval India'. He also made scientific synopsis in English of ancient Ayurvedic texts, 'Charaka Samhita' and 'Susruta Samhita', published by INSA; served as hony editor for Indian Chemical Society's publications.

Died 11 December 1982.

RAY, Rames Chandra

Elected 1943

Born 20 January 1890; Taki, West Bengal
D.Sc. (1923), University of London, UK

Specialization: Inorganic and Physical Chemistry

Research Achievements: Ray's research activities centred on the chemistry of boron and its compounds. He identified two isomers of $H_6B_2O_2$, which were named borohydrates, and were distinguished as α- and β-diboron borohydrates. He succeeded in preparing the potassium salt of the α modification of the diboron borohydrate by the action of dilute potassium hydroxide solution on samples of properly prepared magnesium boride. Ray and his coworkers also studied the mechanism of hydrolysis of magnesium boride. He also investigated the formation of the hydrides of nickel, cobalt and iron.

Positions: Assistant Professor, Patna College (1915); Professor (1927), Head of Chemistry Department (1940), Science College, Patna; Chemical Adviser to the Government of Bihar (1940).

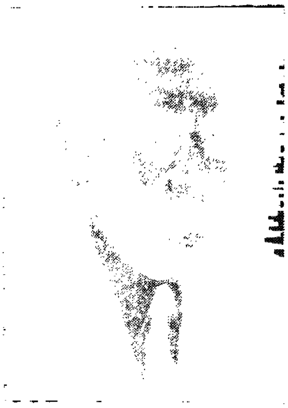
Learned and Professional Societies: Fellow, Royal Institute of Chemistry of Great Britain and Ireland, and Indian Institute of Science (1926).

Awards and Honours: President, Chemistry Section, Indian Science Congress (1944).

Died 3 December 1959.

RAY, Surendra Nath

Elected 1961



Born 4 October 1908; Calcutta, West Bengal
Ph.D. (1934), University of Cambridge, UK; D.Sc. (*h.c.*) Society of Arts and Science, Rio de Jeneiro

Specialization: Biochemistry, Nutritional Physiology

Research Achievements: Ray elaborated a method for estimating vitamin C, which is now the standard technique. He worked on the mineral and fat requirements of livestock and elucidated the aetiology of lameness of cattle in certain parts of India as due to chronic fluorine intoxication and discovered the existence of copper deficiency in livestock in certain parts of India. He also worked on the interrelationship of cobalt and synthesis of vitamins in ruminants. At Karnal, he worked on the protein and energy requirements of dairy cattle, on the efficacy of high- roughage diets in maintaining dairy stock and the effect of diet on rumen development in young calves. Also worked on the effect of climate on the physiological behaviour of zebu cattle and of different dietary regimes on the metabolic pattern in the rumen of cattle and buffalo.

Positions: Professor and Head, Department of Chemistry, Carmichael Medical College (now R.G. Kar Medical College), Calcutta; Research Officer (Physiology) (1944-57), Officiating Head (Animal Nutrition Division) (1957-58), Indian Veterinary Research Institute, Izatnagar and Mukteswar; Head, Dairy Husbandry Division, Officer-in-charge, Eastern Regional Station, Director (1967-68), National Dairy Research Institute, Karnal and Kalyani; Emeritus Scientist, ICAR (1970).

Learned and Professional Societies: Fellow, National Academy of Sciences (India); Member (Vice-President), Indian Dairy Science Association, Indian Association of Animal Production (Vice- President), Sigma Xi, USA; Hony Fellow, School of Biochemistry, Wisconsin, USA.

Awards and Honours: President, Physiology Section, Indian Science Congress (1958).

Policy-making Bodies: Chairman, Working Group on Nutrition, National Commission on Agriculture, Government of India.

Died 29 August 1981.

RAYCHAUDHURI, Amal Kumar

Elected 1987

Born 14 September 1923; Barisal, Bangladesh
D.Sc. (1960), University of Calcutta; D.Sc. (*h.c*), Burdwan University

Specialization: General Relativity, Cosmology

Research Achievements: The equation deduced by Raychaudhuri and bearing his name has played a crucial role in the investigations on singularity in relativistic cosmology.

Positions: INSA Senior Scientist (1988-91); Professor and Head, Physics Department, Presidency College, Calcutta; National Science Foundation Visiting Professor, University of Maryland, USA; Hony Visiting Professor, Jadavpur University, Calcutta.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India); Hony Fellow, Astrophysical Society of India; Inter-University Centre of Astronomy and Astrophysics, Pune.

Awards and Honours: INSA-Vainu Bappu Memorial Award (INSA) (1991); A.C Banerjee Memorial Lecture Award (National Academy of Sciences, India).

Author/Editor Facet: Author of: (1) 'Lecture on Classical Mechanics', (2) 'Theoretical Cosmology', (3) 'Classical Theory of Electricity and Magnetism' and (4) 'General Relativity , Astrophysics and Cosmology' (co-author).

Address: 102/D, Ballygunge Place, Calcutta 700 019; Tel: (033) 4750147.

RAYCHAUDHURI, Sachi Prasad

Elected 1956

Born 15 September 1907; Kulkiti, Bangladesh
Ph.D. (1940), University of Edinburgh, UK

Specialization: Molecular Cytogenetics

Research Achievements: Raychaudhuri has done much research in animal cytogenetics. He has tackled fundamental cytogenetical problems using the chromosomes of the germ-cells of animals both under normal conditions and after physical and chemical treatments. Studied the structure and behaviour of chromosomes with special reference to the sex-determining mechanism of nearly 200 species of insects and Arachnids. His studies on *Drosophila* showed that the production of sex- limited lethal mutations was independent of the radiation dosage administered in the germ- cells. He and his colleagues also studied the effect of X-rays on the germ-cells of grasshoppers. Dicentric bridges in meiosis, he found, resulted from single chromosome break and the breaks vary linearly with the dosages and are independent of the intensity of radiation. He also did some research on human cancer chromosomes and electron microscopic studies of animal chromosomes.

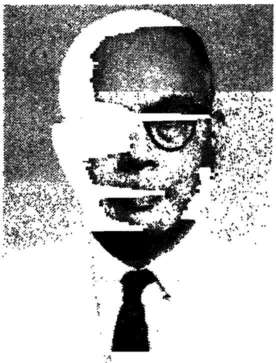
Positions: Professor (Retd), Genetic Research Unit, Faculty, Institute of Nuclear Physics, University of Calcutta.

Awards and Honours: Sunder Lal Hora Medal (INSA) (1987).

Address: 30 A, Old Ballygunge Second Lane, Calcutta 700 019; Tel: (033) 473790.

RAYCHAUDHURI, Satya Prasad

Elected 1952



Born 23 April 1904; Calcutta, West Bengal
D.Sc. (1932), University of Calcutta; D.Sc. (1945), University of London, UK

Specialization: Soil Science, Agricultural Chemistry

Research Achievements: Raychaudhuri initiated research on red and lateritic soils in India, prepared the soil map of India and initiated soil-and land-use survey. His work on soil testing and the use of balanced fertilizers led to the development work in these fields. His study on agriculture in ancient India led to the publication of several books and bulletins on the subject.

Positions: Head, Division of Soil Science and Agricultural Chemistry (1949-58), Chief Soil Survey Officer (1958-61), Indian Agricultural Research Institute, New Delhi; Senior Specialist (Land Resources), Planning Commission (1961-69); Chief Agronomist, Shriram Khad Programme, New Delhi.

Learned and Professional Societies: Fellow, National Academy of Sciences (India); Member, Indian Chemical Society, Indian Society of Soil Science (President, 1960-61), Indian Chemical Society, Indian Society of Agricultural Chemists, Soil Conservation Society of India, Soil Conservation Society of America, Indian Society of Agronomy, Royal Institute of Chemistry (London), World Academy of Arts and Science and International Society of Soil Science; Hony Member, USSR Society of Soil Scientist.

Awards and Honours: President, Agricultural Sciences Section, Indian Science Congress (1955-56).

Lectureships: Baradanada Chatterjee Memorial Lecture (1975); R.V. Tamhane Memorial Lecture (1977); J.N. Mukherjee Lecture (Indian Society of Soil Science) (1983).

Died 3 January 1986.

RAYCHAUDHURI, Syama Prasad

Elected 1966

Born 31 December 1915; Calcutta, West Bengal
Ph.D. (1949), University of Calcutta

Specialization: Plant and Forest Pathology, Medicinal and Aromatic Plants

Research Achievements: Raychaudhuri has worked on citrus dieback, mango malformation, sandal spike, cereal viruses, market pathology and storage diseases. His basic researches relate to plant viruses and mycoplasmas, tissue culture, deficiency diseases, non-wood forest products, medicinal and aromatic plants. He has worked out in detail the complex nature of citrus dieback disease, cause of mango malformation, control of sandal spike, as well as storage diseases and deficiency disease of guava in Rajasthan.

Positions: Professor of Mycology and Plant Pathology, and Head, Division of Mycology and Plant Pathology, Indian Agricultural Research Institute, New Delhi; Advisor, Haryana Agricultural University, Hisar; Distinguished Professor in universities of Japan and Canada; Richard Merton Professor in Germany (twice); Visiting Professor at Rutgers University, USA.

Learned and Professional Societies: Fellow, National Academy of Sciences (India), American Phytopathological Society, Indian Phytopathological Society, Indian Virological Society, Indian Mycological Society, and Indian Society of Mycology and Plant Pathology.

Awards and Honours: Rafi Ahmed Kidwai Memorial Prize (1966- 67); International Union of Forestry Research Organizations (IUFRO) Distinguished Services Award (1990); International Organization of Citrus Virologists Award (1992); Shyam Bahadur Saksena Memorial Award (INSA) (1993).

Author/Editor Facet: Authored/edited 25 books; served as editor of *Indian Phytopathol.*; currently editor of *Int. J. Trop. Plant Dis.*, *Rev. Trop. Plant Pathol*;

was member of advisory boards of: 'Plant Diseases' (Academic Press) and 'Plant Protection' (UK).

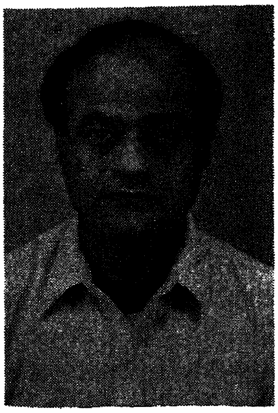
Policy-making Bodies: Corresponding Member, (IUFRO); Executive Committee Member, International Society of Citriculture; Vice-President, International Association for Study of Forest Medicinal Plants.

Other Contributions: Created a strong school of Plant Pathology in Delhi.

Address: A-61, Alaknanda, Shivalik Apartments, Kalkaji, New Delhi 110 019; Tel: (011) 6437561.

REDDY, Borra Madhava

Elected 1992



Born 29 September 1934; Marakalakuppam,
Andhra Pradesh
D.Sc. (1963), Andhra University, Waltair

Specialization: Radio Science and Atmospheric Sciences

Research Achievements: Reddy gave the first ever experimental description of the thermal structure of the topside ionosphere, using NASA satellites. At National Physical Laboratory, he has initiated a number of new experiments on radio communications, on remote sensing of the atmosphere, and on ozone and greenhouse gases including over Antarctica.

Positions: Head, Radio Science Division, National Physical Laboratory, New Delhi; NASA Research Associate (1964-67); Visiting Professor, Institute of Space Sciences, Japan (1991- 92)

Learned and Professional Societies: Fellow, Institution of Electronics and Telecommunication Engineers (India).

Awards and Honours: Vikram Sarabhai Award (Hari Om Ashram) (1975).

Author/Editor Facet: Member, editorial boards of: *Indian J.Radio Space Phys.*, *Indian J. Phys.*, and *Mausam*; edited several books including 'URSI Handbook on Radio Propagation in the Tropics'.

Policy-making Bodies: Founding Member, SUNDIAL International Team; Member, URSI Committee on Developing Countries; IUWDS Representative of URSI; Chairman, Programme Advisory Committee on Atmospheric Sciences (DST);

Chairman, Research Council, Indian Institute of Geomagnetism, Bombay; Member, MST Radar Governing Council; Chairman, CSIR Antarctic Research.

Other Contributions: Reddy's group on Radio Communications in NPL is the only group in the world which has expertise on tropical communications in ionized and non-ionized media over a wide spectrum of frequencies.

Address: Head, Radio Science Division, National Physical Laboratory, New Delhi 110 012; Tel: (011) 5787657; Telex: 31 77384 RSD IN; Fax: 91-11-5752678; Res: 13/15, M.S. Building, NPL Colony, New Delhi 110 060; Tel: (011) 5744622.

REDDY, Chillakuru Abhirama *Elected 1989*

Born 15 October 1931; M. Palem, Andhra Pradesh
D.Sc. (1963), Andhra University, Waltair

Specialization: Atmospheric Dynamics & Electrodynamics

Research Achievements: Reddy's main work is in atmospheric dynamics and electrodynamics. Using rocket and balloon data from India and other tropical locations, he and his colleagues have brought out several new results on equatorial Kelvin waves and the annual and semiannual oscillations. The large longitudinal and cycle-to-cycle variations in the above oscillations have been demonstrated for the first time. The radiative damping of equatorial waves have been quantified. Reddy and his colleagues have also done pioneering work on the physics of ionosphere- magnetosphere interactions. They demonstrated very early that the electric field fluctuations in the equatorial electrojet, as measured with the VHF backscatter radar at Thumba, are related to the auroral electrojet fluctuations caused by solar wind- magnetosphere interactions; and thus the close coupling of the equatorial ionosphere with the magnetosphere was established.

Positions: NRC Senior Research Associate at NASA/Goddard Space Flight Centre, USA; Scientist H/Director, Space Physics Laboratory, Vikram Sarabhai Space Centre (VSSC), Trivandrum; Visiting Professor, Radio Atmospheric Science Centre, Kyoto University and at Institute of Space and Astronautical Science in Japan; Visiting Scientist, C.N.R.S./C.N.E.T., France and at National Centre for Atmospheric Research.

Awards and Honours: J.C. Bose Premium Award (1958).

Policy-making Bodies: Member, Advisory Committee for Space Sciences, Scientific Advisory Committee of IMAP, Executive Committee, Instrument Society of

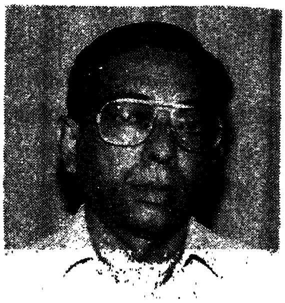
India, Centre for Earth Sciences Studies, (Trivandrum), Rocket-borne Scientific Experiments Committee and member of 10 international scientific committees.

Other Contributions: Reddy was the prime mover of the installation of several sophisticated equipment at Thumba: (1) meteor wind radar, (2) ruby laser based pulsed Lidar (3) C.W. laser based bistatic Lidar, (4) multi-wavelength solar radiometers, (5) acoustic radars on the monostatic, bistatic and tristatic modes and (6) VHF backscatter radar.

Address: Planetary Atmospheres Branch, Code 914, NASA/Goddard Space Flight Centre, Greenbelt, MD 20771, USA; Permanent Address: 6/748, Anantha Colony, Vattijurkavu, Trivandrum 695 013, Tel: (0471) 61520.

REDDY, Chintala Raja Ram Mohan

Elected 1985



Born 16 January 1929; Cuddapah, Andhra Pradesh
Ph.D. (1972), D.Sc. (1976), D.Sc. (*h.c.*) (1988), Andhra University

Specialization: Pathology, Cancer Epidermiology and Parasitology

Research Achievements: Reddy did much work on epidermiology, pathology and biology of guinea worm infection and hydatid disease at Kurnool (Andhra Pradesh). Has done extensive work on the habit of reverse smoking and its relation to carcinoma of palate.

Positions: Professor of Pathology, Andhra Medical College; Director of Medical Education, Andhra Pradesh, Hyderabad.

Learned and Professional Societies: Fellow, National Academy of Medical Sciences (India); Indian Academy of Sciences, and Andhra Pradesh Academy of Sciences.

Awards and Honours: Sandoz Oration Medal and Award (ICMR); Hari Om Ashram Alembic Research Award (Medical Council of India) (1979).

Lectureships: Lederle Endowment Lecture (Academy of Medical Sciences of Andhra Pradesh) (1968); Yellapragada Subba Rao Memorial Orations (Indian Medical Association) (1975, 1983); Sandoz Oration at ICMR (1976); AMCOSA

Oration (1979); Colonel Waghray Memorial Oration of College of General Practitioners, Hyderabad (1981).

Policy-making Bodies: Member, expert advisory panel on smoking and health, WHO (1978-83).

Address: Apartment 404, Mount Kailash, Road No. 4, Banjara Hills, Hyderabad 500 034; Tel: (0842) 223657.

REDDY, Gidnahalli Karagappa Narayana

Elected 1984

Born 24 June 1928; Chikballapur, Karnataka
Ph.D. (1961), University of London, UK

Specialization: Coordination Chemistry, Organometallics, and Catalysis.

Research Achievements: Reddy carried out pioneering work on Hydride and hydrido carbonyl complexes of platinum group metals and bi- and polynuclear complexes involving dienes and bridging nitrogen donor ligands. Also made significant contributions on the use of metal complexes in homogeneous catalysis and coordination of perchlorate ion.

Positions: Professor and Chairman, Department of Chemistry, Bangalore University, Bangalore; Vice-Chancellor, Karnatak University, Dharwad.

Learned and Professional Societies: Fellow, National Academy of Sciences (India).

Author/Editor Facet: Wrote two textbooks on General and Inorganic Chemistry.

Address: 622, 80 Feet Road, II Block, Rajajinagar, Bangalore 560 010; Tel: (080) 324546.

REDDY, Gurjal Madhava

Elected 1985

Born 16 November 1932; Damera, Andhra Pradesh
Ph.D. (1962), University of Missouri, Columbia, Missouri, USA

Specialization: Plant Genetics, Plant Molecular Biology

Research Achievements: Reddy analyzed nine genes controlling anthocyanin biosynthesis into a linear unidirectional gene action sequence through inter-tissue complementation technique: CI-C1- C2-R-(In)-A1-A2-BZ1-BZ2-cyanidin-3-glucoside. Biochemical studies with aleurone tissue of genetically blocked mutants provided insight into gene-enzyme product relationship in anthocynanin biosynthesis in maize, a classical example in higher plants. Five non-allelic induced dwarfs in rice are being utilized in breeding high-yielding varieties to avoid genetic vulnerability caused by the repeated use of Dee-Geo-Woo-Gen-dwarfing gene.

Positions: Principal Coordinator, Centre for Plant Molecular Biology (1991-); Dean, Faculty of Science (1991-92); Principal, University College of Science (1983-87); Dean, College Development Council (1987-91) and Head, Department of Genetics (1979-83) Osmania University, Hyderabad.

Learned and Professional Societies: Fellow, National Academy of Sciences (India), New York Academy of Sciences, and National Academy of Agricultural Sciences (India).

Awards and Honours: Best Teacher's Award (Andhra Pradesh Government) (1984); UGC National Lecturer (1984).

Author/Editor Facet: Editor, 'Gene Structure and Function in Higher Plants' (Oxford & IBH Press), 'Plant Cell and Tissue Culture of Economically Important Plants' and monograph on 'Plant Cell and Tissue Culture: A Lab Manual'.

Address: Department of Genetics, Osmania University, Hyderabad 500 007; Tel: (0842) 868087; Fax: 91-842-869092, 868087; Res: B- 13, Prasanthnagar, Vidyanagar, Hyderabad 500 044; Tel: (0842) 860372.

REDDY, Vellenki Umapathi

Elected 1993

Born 10 August 1939; Venkiryal, Andhra Pradesh
Ph.D. (1971), University of Missouri, USA

Specialization: Adaptive and Sensor Array Signal Processing

Research Achievements: Reddy has made fundamental contributions to the development and performance analysis of optimal algorithms, and efficient adaptive implementations thereof, for several important problems in high-resolution model-based signal processing.

Positions: Professor, Electrical Communication Engineering, Indian Institute of Science, Bangalore (1988-); Professor and Project Director, Research and Training Unit for Navigational Electronics, Osmania University, Hyderabad (Founding Director); Visiting Professor, Electrical Engineering Department, Stanford University, USA; Professor, Radar and Communications Centre, Indian Institute of Technology, Kharagpur.

Learned and Professional Societies: Fellow, Institution of Electronics and Telecommunication Engineers (IETE); Indian Academy of Sciences, and Indian National Academy of Engineering.

Awards and Honours: S.K. Mitra Memorial Award (IETE) (1989).

Author/Editor Facet: Served as guest editor for special issues of *Sadhana*, and as member of its editorial board; contributed a chapter on "Techniques in Optimum Weighted Smoothing" to theme volumes in 'Control and Dynamic Systems' (Academic Press).

Address: Professor, Electrical Communication Engineering, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2280); Fax: 91-80-341683; Telex: 085- 8349 BG; E-mail: vur@ece.iisc.ernet.in; Res: Qtr No. E-16, IISc, Bangalore, 560 012; Tel: (080) 341465.

ROHATGI-MUKHERJEE, Krishna Kamini *Elected 1984*

Born 2 August 1924; Patna, Bihar
D.Phil. (1952), University of Oxford, UK

Specialization: Photophysics, Photochemistry, Spectroscopy, Physical Chemistry

Research Achievements: Rohatgi-Mukherjee's early work on dye- aggregation and consequent hypochromism due to excitonic interaction won her international peer recognition. She has carried out studies on: photophysical properties of molecules in electronically excited singlet and triplet states; singlet oxygen and photodynamic action; photoelectrochemistry; photochemical conversion and storage of solar energy; photophysics and photochemistry of porphyrins;

photoinduced electron transfer in organized media, such as polymers, micelles and liposomes. Her doctoral work on photoreaction between anthracene and CCl_4 led to the concept of photo- induced electron transfer mechanism.

Positions: Professor of Chemistry, Jadavpur University, Calcutta (Retired); INSA Senior Scientist (1990-93).

Learned and Professional Societies: Fellow, Indian Chemical Society (Vice-President, 1979-81), Asiatic Society; Founder Secretary, Indian Photobiology Society (1964-92); Fellow, West Bengal Academy of Science and Technology, Indian Society for Biophysics, Indian Photobiology Socity; Hony Member (President, 1985-88), Association Internationale de Photobiologie; Member/Fellow of several other professional bodies.

Awards and Honours: UGC National Lecturer (1979); Sir C.V. Raman Award (Indian Science Congress Association) (1991); President, Chemistry Section, Indian Science Congress (1984- 85) and International Congress on Photobiology (1988).

Lectureships: R.P. Mitra Lecture (University of Delhi).

Author/Editor Facet: Written: 'Fundamentals of Photochemistry' (3 edns); member, editorial boards of: *Proc. Indian Nat. Sci. Acad.* (1984-86), *Indian J. Chem.* (1980-82, 1992- 94), and *Indian J. Chem. Educ.* (1968-78).

Policy-making Bodies: Member, National Representative, IUPAC Committee on Teaching of Chemistry (1982-93); and Committee Internationale de Photobiologie (1981-94); served on several CSIR committees.

Address: Flat 9, Jodhpur Court, 332 Jodhpur Park, Calcutta 700 068; Tel: (033) 4733974.

ROONWAL, Mithan Lal

Elected 1945

Born 18 September 1908; Jodhpur, Rajasthan
Ph.D. (1935), Sc.D. (1967), University of Cambridge, UK

Specialization: Entomology

Research Achievements: Roonwal did extensive research on insect embryology, ecology, morphology, and taxonomy of locusts and termites; forest entomology; and animal behaviour especially of primates. He put forward: a new theory of gastrulation in insects; new phase characters, polymorphism and gregarization theory in locusts; and new taxa in termites. He made significant observations on primates, especially on intraspecific variation and tail-form and carriage.

Positions: Officer-In-Charge, Birds and Mammals Section, Zoological Survey of India (1939-40); Forest Entomologist and Chief Research Officer, Forest Research Institute, Dehra Dun (1949-56); Director, Zoological Survey of India (1956-65); Professor & Head, Department of Zoology (1965-66) and Vice-Chancellor, University of Jodhpur; Emeritus Scientist (CSIR), Desert Research Station, Jodhpur (1969-73).

Learned and Professional Societies: Life Fellow, Zoological Society of India; Hony Member, All-Union Entomological Society, Soviet Academy of Sciences (Moscow), and Entomological Society of India; Member, INSA Council (1961- 63).

Awards and Honours: Tata Medal (Zoological Society of India) (1956); Har Swarup Memorial Lecture Award (INSA) (1984).

Died 22 July 1990.

ROW, Lakkaraju Ramachandra

Elected 1966

Born 12 December 1916; Ravipadu, Andhra Pradesh
D.Sc. (1945), Andhra University, Waltair

Specialization: Organic Chemistry

Research Achievements: Row has contributed significantly to the chemistry of triterpenoids and saponins, alkaloids, lignans, flavonoids and related polyphenolics, and complex steroids.

Positions: Emeritus Professor (1977, 1981); Professor (1973- 76); Special Officer, Postgraduate Courses (1977-80); Principal (1976); Head, Department of Chemistry, Science College (1968-76); Head, Department of Chemistry and Principal, Postgraduate Centre, Guntur (1967-68), all at Andhra University.

Learned and Professional Societies: Fellow, Royal Institute of Chemistry (UK), Andhra Pradesh Academy of Sciences, and Indian Academy of Sciences.

Address: 'Saroja' 10-2-9/3, Siripuram, Waltair, Visakhapatnam 530 003.

ROW, Lt Col. Ragavendra

Foundation Fellow

Born 16 November 1871
D.Sc., University of London, UK

Specialization: Medical Science

Research Achievements: The first Indian D.Sc. from University of London, Row was a pioneer in medical research. His areas of research covered physiology, enteric fever, plague, tuberculosis, leprosy, malaria, leishmaniasis, and others.

Positions: Indian Medical Service: Medical Officer, Lady Hardinge Hospital, Delhi (1914-19); Professor of Pathology, Grant Medical College, Bombay (1926-31); Professor, Haffkine Institute, Bombay.

Learned and Professional Societies: Fellow, Indian Medical Association; Member, British Medical Association.

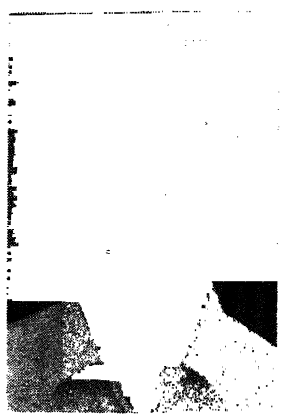
Awards and Honours: *Kaiser-i-Hind* Gold Medal (1912); OBE (1919); Lord Minto Medal (1920); Barclay Medal (Asiatic Society).

Other Contributions: Col. Row rendered valuable services to the Lady Tata Research Scheme in Bombay.

Died 14 November 1954.

ROY, Amalendu

Elected 1984



Born 1 January 1924; Narayangunj, Bangladesh
Ph.D. (1961), Indian Institute of Technology, Kharagpur

Specialization: Exploration Geophysics

Research Achievements: Roy has done extensive work covering: optical analogue of gravity and magnetics, Ambiguity in geophysical interpretation, new interpretation techniques for geophysical data, analytic contribution and its convergence properties, resistivity signal formation and contribution by ground elements/compartments, resistivity depth of investigation, focused resistivity logs, comparative array performance, and magnetic transformations.

Positions: Superintending Geophysicist, Oil & Natural Gas Commission; Scientist F/Acting Director, National Geophysical Research Institute, Hyderabad; UN Specialist/Consultant; Professor of Geophysics, University of IFE, Nigeria.

Author/Editor Facet: Served on the editorial board of *Geoexploration*.

Address: C/o Sri Annada Devi Matri Ashram, B3/189, Shivalaya, Varanasi, 221 001; Tel: (0542) 310145.

ROY, Amiya Krishna

Elected 1954

Born 5 January 1900
B.A. (Hons) (1924), University of Oxford, UK

Specialization: Meteorology

Research Achievements: Roy's interests were mainly in meteorology, cloud physics and weather modification. He was one of the pioneer Indian meteorologists who attempted to give an explanation for the mechanism of the formation and intensification of tropical storms. He came up with the concept of air masses, which he used for analyzing pre- monsoon thunderstorm activity, cyclonic storms, etc. The first systematic studies on cloud physics and precipitation enhancement in India were started under Roy's leadership at the National Physical Laboratory, New Delhi. He categorized clouds mainly into two groups 'warm' and 'cold', and studied their characteristics for ascertaining the feasibility of stimulating rain from them by artificial methods. Did valuable theoretical work on droplet growth in cumulus. Also, contributed to nucleation physics to ascertain its significance in relation to rainfall.

Positions: Indian Meteorological Service: Meteorologist (Pune), Regional Director (Calcutta) and Deputy Director- General of Observatories (Forecasting), India Meteorological Department, Pune; Research Scientist, Rain and Cloud Physics Research Unit, National Physical Laboratory, New Delhi.

Learned and Professional Societies: Fellow, Indian Physical Society; Member, Aeronautical Society of India.

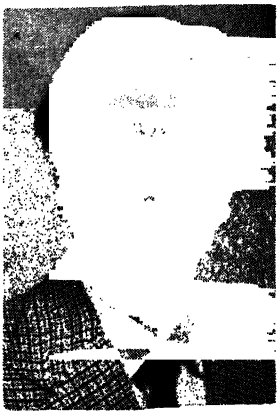
Author/Editor Facet: Published a technical note on 'Air Masses in India' (1946), which became a reference work.

Policy-making Bodies: Served on the WHO Commission for Meteorology.

Died 25 October 1973.

ROY, Ashit Baran

Elected 1990



Born 18 March 1938; Faridpur, Bangladesh
Ph.D. (1965), Jadavpur University, Calcutta

Specialization: Structural and Precambrian Geology

Research Achievements: Roy's early research was on (i) interrelation between metamorphism and deformation in Singhbhum and in the Caledonides of Sweden; and (ii) evolution of slaty cleavage fabric. Subsequent research relates to the elucidation of structural geometry and tectono-stratigraphical modelling of the basement and the cover rocks of the Precambrian of Rajasthan.

Positions: Professor of Geology, Mohanlal Sukhadia University, Udaipur (1985-).

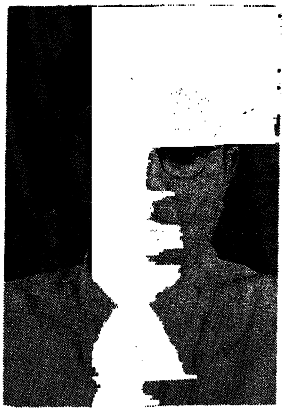
Learned and Professional Societies: Fellow, Indian Academy of Sciences; Life Fellow, Geological Society of India; and Geological, Mining & Metallurgical Society of India.

Author/Editor Facet: Edited Memoir 7 of Geological Society of India: 'Precambrian of Aravalli Mountains'; member, editorial boards of: *Indian Min.* (1989-94) and *Indian J. Geol.* (1992-).

Address: Professor, Department of Geology, Mohanlal Sukhadia University, 51 Saraswati Marg, Udaipur 313 001, Tel:(0294) 28366.

ROY, Bhabesh Chandra

Elected 1957



Born 1 August 1907
D.I.C., University of London, UK; Dr Ing., Freiberg, Germany

Specialization: Geology

Research Achievements: Roy did much work in mapping. Investigated the mineral deposits in Orissa, Madras, Saurashtra and Rajasthan.

Positions: Superintending Geologist, Geological Survey of India.

Died 6 August 1984.

ROY, Binod Bihari

Elected 1966

Born 1 January 1925; Moondotola, West Bengal
D.Sc. (Physiology) (1960), D.Sc. (Experimental Surgery) (1966), University of Calcutta

Specialization: Orthopaedic Surgery and Experimental Surgery

Research Achievements: Roy studied adrenocortical response in some surgical and experimental conditions. His most important researches were on hypothalamo-pituitary-adrenal-axis in stress from man down to lower vertebrates up to fish, and their mechanisms of adaptation to environment.

Positions: Professor and Head, Department of Orthopaedic Surgery and Head, Department of Experimental Surgery, R.G. Kar Medical College and Hospital, Calcutta.

Learned and Professional Societies: Life Member, Association of Surgeons of India; Member, Association of Orthopaedic Surgeons of India.

Awards and Honours: Coates Gold Medal (University of Calcutta) (1963); Nilratan Brahmachari Gold Medal (1975); Suhasini Das Gold Medal (1978).

Lectureships: Lady Brahmachari Lecture (1975).

Author/Editor Facet: Roy's researches are embodied in two publications: 'Neuroendocrinological Studies in Stress' (1976) and 'Comparative Aspects of the Pituitary Gland' (1982), both published by University of Calcutta.

Died 10 November 1986.

ROY, Durga Prasad

Elected 1993

Born 29 July 1941; Cuttack, Orissa
Ph.D. (1966), University of Bombay

Specialization: High-Energy Physics (Theory and Phenomenology)

Research Achievements: Roy isolated the lepton signature for the top quark and the missing transverse momentum signature for the supersymmetric particles. These signatures are widely used in global search for these particles at high-energy hadron colliders.

Positions: Professor, Tata Institute of Fundamental Research, Bombay; Visiting Scientist, CERN, Geneva (1991-92); NORDITA Visiting Fellow, University of Helsinki (1987).

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: Meghnad Saha Award (UGC) (1989).

Author/Editor Facet: Co-edited 'Phenomenology of the Standard Model and Beyond' (World Scientific, Singapore, 1989).

Address: Professor, Theoretical Physics Section, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152971 (Ext 223); Telex: 011- 83009 TIFR IN; Fax: 91-22- 2152110; E-mail: dproy@tifrvax.bitnet; Res: 306, Bhaskara, TIFR Quarters, Homi Bhabha Road, Colaba, Bombay 400 005; Tel: (022) 2152673.

ROY, Probir

Elected 1992

Born 4 October 1942; Calcutta, West Bengal
Ph.D. (1968), Stanford University, USA

Specialization: Elementary Particle Physics: Field Theory and Phenomenology

Research Achievements: Roy derived an important sum-rule for photon-photon scattering, which bears his name. His other works relate to solution to Thirring model with U(N) symmetry, first natural theory of ultralight Dirac neutrino, and constraints from tree unitarity in broken supergravity.

Positions: Professor, Tata Institute of Fundamental Research, Bombay (1973-); Scientific Associate, CERN, Geneva; Visiting Professor, University of Texas, Austin, USA.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, and New York Academy of Sciences.

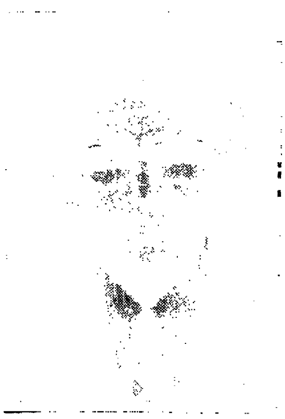
Awards and Honours: Shanti Swarup Bhatnagar Prize (1987).

Author/Editor Facet: Edited/co-edited 'Theory of Lepton- Hadron Process at High Energies' (Clarendon Press, 1975), ICOBAN 1982 *(Pramana Suppl.*, 'Supersymmetry and Supergravity/ Nonperturbative QCD' (Springer Lectures Vol. 208), 'Phenomenology of the Standard Model and Beyond' (World Scientific, 1989); member, editorial boards of: *Pramana*; *Indian J. Pure Appl. Phys.*; *J. Phys.*

Address: Full Professor, Theoretical Physics Group, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152971; Res: 710, Bhaskara, TIFR Housing Colony, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152673.

ROY, Ram Parikshan

Elected 1968



Born 1 January 1920; Gangapur, Bihar
Ph.D. (1953), University of Cambridge, UK

Specialization: Cytogenetics, Plant Breeding, Tissue Culture, Cytotaxonomy

Research Achievements: Roy's work on genomic (chromosomal) analysis of the species of *Aegilops* led to the identification of species involved in the origin and evolution of bread wheats. He detected an excellent sex determination genetic system in cucurbit (*Coccinea indica*). Established the relative role of X and Y chromosomes in the determination and manifestation of sex by raising a hierarchy of polyploid forms, namely triploid, tetraploid, pentaploid and hexaploid as also trisome, tetrasome, double trisome, etc. Located the specific chromosome region carrying the male maturity and fertility genes. Employed tissue culture to raise haploid, aneuploids and sex-aberrant types to score specific genes and to locate mutant genes in mutagenic treated materials. Pioneered cytogenetic investigations in an important timber sal (*Shorea robusta*), *S. assamica* and a dozen other allied timber genera. Did genome analysis by raising interspecific hybrids in the fern genus *Adiantum*.

Positions: Senior Professor of Botany and Dean of Science, Head, Department and Coordinator, UGC Centre of Special Assistance in Cytogenetics CSIR Emeritus Scientist (1982), all at Patna University.

Learned and Professional Societies: Fellow, National Academy of Sciences, India (sometime President), Indian Botanical Society (sometime President), Indian Society of Genetics and Plant Breeding, Society of Cytologists and Geneticists, and Linnaean Society (London); Member, INSA Council (1972-74).

Awards and Honours: Birbal Sahni Gold Medal (1974); Jawaharlal Nehru Fellowship (1975); President, Indian Science Congress (1972).

Author/Editor Facet: Contributed chapters to many books, e.g. 'Biology and Utilization of the Cucurbitaceae' (Cornell University, 1990); edited, *J. Cytol. Genet.* (for 14 years); member, editorial boards of: *J. Indian Bot. Soc.* and *Biosci.*; patron, *Mendel.*

Other Contributions: As Founder Secretary of Bihar Association for the Advancement of Science in 1973, Roy initiated steps to develop a science centre at Patna for popularizing science.

Address: Road No.7, Rajendranagar, Patna 800 016; Tel: (0612) 654975.

ROY, Samarendra Nath

Elected 1944

Born 1906; Khulna, Bangladesh
M.Sc. (1931), University of Calcutta

Specialization: Mathematical Statistics

Research Achievements: Roy's contribution to statistics related to: (i) multi-variate analysis, (ii) testing of hypotheses, and (iii) analysis of categorical data. In some of his earlier work on multi-variate analysis, Roy depended heavily on rectangular coordinates and higher dimensional geometry. Later he used the more elegant method of matrix algebra, and obtained useful results on matrix calculus. Studying the various aspects of testing composite hypotheses he proposed a heuristic method of test construction--later known as the union-intersection principle. He devised methods of analysis for multidimensional contingency tables of various types. This required a new formulation of the then current concepts of correlation, regression, dispersion, etc. He also discussed the analysis of mixed types of models in the sense of being partly normal variable type and partly categorical type. He was also interested in the design and analysis of experiments with more than one factor and more than one response.

Positions: Scientist, Indian Statistical Institute; Head, Department of Statistics, University of Calcutta; Professor of Statistics, North Carolina State University, USA.

Learned and Professional Societies: Fellow, International Statistical Institute.

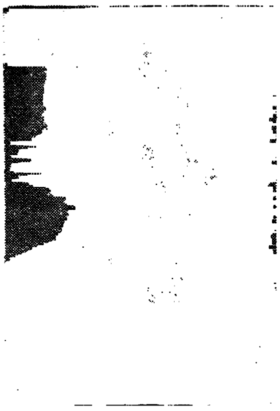
Awards and Honours: President, Statistics Section, Indian Science Congress (1948).

Author/Editor Facet: Wrote a book titled 'Some Aspects of Multivariate Analysis'.

Died 23 July 1964.

ROY, Sarat Chandra

Foundation Fellow



Born 4 November 1871; Khulna, Bangladesh
M.A. (1893), LL.B. (1895), University of Calcutta

Specialization: Anthropology

Research Achievements: Roy recorded the details of the social organization, economic life, laws of succession and inheritance and religious experience of the tribals of Bihar. The scientific presentation of data on the tribal life of the Mundas soon established him as an authority on the Mundas and this was a landmark in his career. He published several monographs on the tribes of the Chotanagpur plateau. His work on the Oraons, a primitive tribe of the Dravidian linguistic family, revealed the similarity with primitive cultural life, while also bringing out also the minute differences that existed between the Oraons and the Mundas. He explored many prehistoric sites in Chotanagpur known as 'Asura' sites, and the rich collection of antiquities, he has dug up, will always remain a monument to his scholarship and resourcefulness.

Positions: Lawyer-Scientist, Chotanagpur, Ranchi.

Learned and Professional Societies: Hony Member, Folklore Society of London (1920) and All-India Oriental Conference (1933).

Awards and Honours: *Kaiser-i-Hind* Medal (1913); *Rai Bahadur* (1919); President, Anthropology Section, Indian Science Congress (1920).

Author/Editor Facet: Roy published many monographs embodying the results of his studies, among them are: 'Oraons' (1916), 'Birhors' (1925), 'Oraon Religion and Customs' (1928) and 'Hill Bhuiyas of Orissa' (1935).

Died 30 April 1942.

ROY, Shasanka Mohan

Elected 1989

Born 2 September 1941; Maimansingh, Bangladesh
Ph.D. (1966), Princeton University, USA

Specialization: High-Energy Physics; Foundations of Quantum Theory

Research Achievements: Roy derived (i) an exact integral equation for pion-pion scattering, known as Roy's equation; (ii) rigorous upper bounds for particle-antiparticle total crossection differences and multiparticle Bell inequalities (with Virendra Singh); and (iii) a lower bound on the Bosonic Chandrasekhar mass (with Andrè Martin), $M_{cr} \geq 4[3 \surd 3Gm]^{-1}$.

Positions: Senior Professor, Tata Institute of Fundamental Research, Bombay; Visiting Positions at several universities (University of California, San Diego, Syracuse University, University of Lausanne, University of Alberta), CERN, Geneva and CEN, Saclay

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1981).

Author/Editor Facet: Authored/co-authored five monographs/reviews; co-edited two books: 'Advances in High Energy Physics' (2 vols) (TIFR,1974) and 'Developments in Theoretical Physics' (Oxford & IBH,1989).

Other Contributions: Roy worked for establishing 'Theoretical Physics Seminar Circuit' (funded by DST).

Address: Senior Professor, Theoretical Physics Group, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152971 (Ext 215); Telex: 011-83009 TIFR IN; Fax: 91-022-2152110; E-mail: shasanka @tifrvax.bitnet; Res: 704, Meghnad, TIFR Housing Colony, Colaba, Bombay 400 005; Tel: (022) 2152757.

ROY, Suhrid Kumar

Elected 1940

Born 1 January 1895; Kurulgachi, West Bengal
Ph.D. (1924), University of Zurich, Switzerland

Specialization: Petrology and Economic Geology

Research Achievements: Roy carried out geological surveys of zewar lead-zinc deposits. His contributions were mainly in petrology and economic geology. While at Zurich, he carried out a detailed petrological study in an area of Hercynian mountains (southern Black Forest, Germany) and made a detailed study of the enclaves occurring in the Albtal Granit of the region. He correlated sedimentary

rocks by means of their heavy mineral assemblages. Conducted a detailed study of heavy minerals of the sandstones associated with the coal seams of Jharia coalfield. In Mandi, Roy studied the geology and mineral resources and in Bandsa prospected for water in the Deccan trap locating well sites. In economic geology, his main contribution was on fuel oil from inferior Jharia coals, mica and mica industry of Bihar, and mica pegmatites of Kodarma. He took great interest in ore- microscopy.

Positions: Geologist, Bandsa State, Bombay; State Geologist, Mandi; Professor and Head, Department of Geology, Indian School of Mines, Dhanbad (1928-46).

Learned and Professional Societies: President, Geological, Mining and Metallurgical Society of India.

Awards and Honours: President, Geology Section, Indian Science Congress (1939).

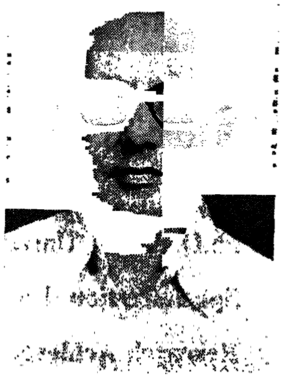
Other Contributions: Roy introduced applied aspects of geology in the syllabus of Indian School of Mines.

Died 16 July 1959.

ROY, Supriya

Elected 1972

Born 10 June 1931; Calcutta, West Bengal
D.Sc. (1963), University of Calcutta, West Bengal



Specialization: Economic Geology

Research Achievements: Roy's researches relate to the determination of the geological environments of formation of Indian manganese deposits through the Precambrian; metamorphic controls on changes in mineralogy and geochemistry of manganese- rich deposits; global metallogeny of manganese and genetic classification; and effects of post- depositional changes within deep-sea ferromanganese nodules of the Indian Ocean and their implications.

Positions: Professor of Geology, Jadavpur University (currently); UGC National Fellow in Geology (1982-84).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Geological Society of India, Geological, Mining and Metallurgical Society of India, and International Association on the Genesis of Ore Deposits; Member, INSA Council (1979-81).

Awards and Honours: Sarat Lal Biswas Medal (Asiatic Society) (1962); Krishnan Medal (Indian Geophysical Union) (1969); National Mineral Award (1969); Sri S. Narayanaswami Award (Geological Society of India) (1982); UGC National Lecturer (1976-77).

Lectureships: Prince Mukarramjah Endowment Lecture (Indian Geophysical Union, Hyderabad) (1987); Professor N. N. Chatterjee Memorial Lecture (Geological, Mining and Metallurgical Society of India) (1988).

Author/Editor Facet: Authored two books: 'Syngenetic Manganese Formations of India' (Jadavpur University), and 'Manganese Deposits' (Academic Press); associate editor of 'Geology and Geochemistry of Manganese' (3 vols) (E. Schweizerbart' sche Verlagsbuchhandlung, Stuttgart).

Policy-making Bodies: President, Commission on Manganese. IAGOD (1990-94); Global Leader/Co-leader two IGCP projects; served on Geosciences Panel of UGC; Chairman, Research Council, National Institute of Oceanography; Member, Technical Advisory Board of CSIR.

Address: Professor, Department of Geological Sciences, Jadavpur University, Calcutta 700 032; Res: 99/5/10, Ballygunge Place, Calcutta 700 019; Tel: (033) 756578.

ROY, Sures Chandra

Elected 1940

Born 1 March 1899
D.Sc. (1926), University of London, UK

Specialization: Meteorology and Seismology

Research Achievements: A physicist to begin with, Roy specialized in meteorology and seismology. While in charge of the Colaba observatory, he analyzed seismograms from Indian observatories. He brought in several new schemes: (i) establishing a network of radio-wind finding stations in India to make more precise observations; (ii) installing storm-detecting radars at principal airports; and (iii) setting up an improved meteorological organization in Assam, including the Meteorological Centre at Guwahati.

Positions: Indian Meteorological Service: In-Charge, Colaba Observatory, Bombay; Director, Burma Meteorological Service, Rangoon; Deputy Director-General, Administration and Instruments; Director-General of Observatories, India Meteorological Department, New Delhi.

Other Contributions: Roy will be remembered for the growth of meteorological services in India.

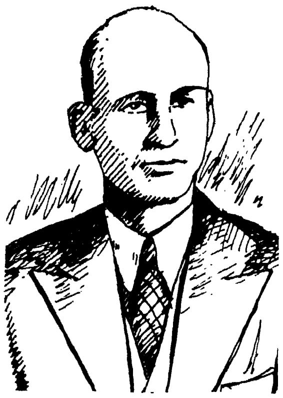
Died 9 December 1970.

ROYDS, Thomos

Foundation Fellow

Born 11 April 1884
D.Sc. (1912), University of Manchester, UK

Specialization: Astronomy



Research Achievements: Royds worked on the periodicities of prominences and their distribution on the solar disc. He carried out a long series of comparative studies between the spectra of laboratory arc lamps and the Sun. His detailed investigations of the shift of solar lines between the centre of solar disc and at the limbs are considered significant contributions to solar spectroscopy. He undertook a crucial experiment during the total solar eclipse of 19 June 1936 in Japan where he found that the differences of shifts for lines of different intensities were maintained right up to totality, and were more than the values predicted by the theory of relativity. He was also interested in spectroheliograms. Studied the heights of dark markings on the solar disc, their distribution and changes in orientation with respect to the solar meridian at different heliocentric latitudes and phases of the solar activity cycle. Explained these changes in terms of differential rotation of solar gases.

Positions: Director, Kodaikanal Observatory (1923); Professor of Astronomy, Istanbul (1942).

Learned and Professional Societies: Fellow, Royal Astronomical Society.

Died 1 May 1955.

RUDRAIAH, Nanjundappa

Elected 1982

Born 10 August 1932; Bellave, Karnataka
Ph.D. (1964), University of Western Ontario, Canada

Specialization: Fluid Mechanics, Magneto-hydrodynamics

Research Achievements: Rudraiah's work spans: (i) stability of flows in layer stratification, thermal stratification, and through porous media with and without the external constraint of magnetic field and/or rotation; (ii) techniques in applied mathematics including regular and singular perturbations, Liapanof and Galerkin techniques, phase-space analysis and numerical techniques; (iii) linear and nonlinear internal gravity waves with and without electromagnetic and/or Coriolis forces; (iv) heat and mass transfer in composite materials; (v) marangoni convection; (vi) flow through and past porous media; (vii) biomechanics; (viii) convection in magnetic fluids; (ix) hydrodynamic dispersion; and (x) interfacial instabilities.

Positions: Vice-Chancellor, Gulbarga University (1990-); Professor and Senior Professor (1967-90), Chairman, Department of Mathematics, (1983-90), Principal, Central College (1983-90), Dean, Faculty of Science, all at Bangalore University, Bangalore.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), and Institute of Mathematics and its Applications (UK); Member, International Society for the Interaction of Mechanics and Mathematics, Poland; Life Member, Indian Mathematical Society, Indian Society of Theoretical and Applied Mechanics, and Indian Plasma Physics Society.

Awards and Honours: UGC National Lecturer (1974-75); FICCI Award (1979); Karnataka Rajyothsava Award (1986); KIT - International Award for Foreign Researcher (1990).

Author/Editor Facet: Edited 'Textbook of Mathematics' (5 vols).

Policy-making Bodies: Member, Advisory Council for Union Cabinet Sub-committee for Improvement of Mathematics; Member, UGC Mathematical Science Panel (1972-82, 1992-); Council Member, Inter-University Centre for Astronomy and Astrophysics.

Other Contributions: Working as Consultant to New Government Electric Factory, Bangalore, Rudraiah made significant contributions.

Address: Vice-Chancellor, Gulbarga University, Gulbarga 585 106; Tel. (08472) 21447; Fax: 91-08472-22039; Res: 492/G, 7th Cross, 7th Block (WK), Jayanagar, Bangalore 560 082; Tel: (08472) 21378, (080) 607256.

SACHAR, Ramesh Chandra

Elected 1989

Born 24 August 1929; Hafizabad, Pakistan
Ph.D. (1957), University of Delhi

Specialization: Plant Biochemistry & Molecular Biology

Research Achievements: Sachar has contributed to our understanding of molecular mechanism in the control of gene expression at the post-transcriptional and post-translational level by phytohormones in higher plants. He was the first to demonstrate that, in wheat, GA_3 promoted active translation of poly(A) polymerase from its stored mRNA and this in turn increased the levels of poly$(A)^{+}$RNA. The stimulatory effect of GA_3 could be counteracted by ABA. Furthermore, he observed repression of poly(A) polymerase activity with a concomitant decrease in the levels of poly $(A)^{+}$RNA in fungal infected wheat embryos and auxin-treated pea epicotyls. Earlier virtually nothing was known about the regulation of RNA- processing enzymes in eukaryotes. At the post-translational level, GA_3 treatment to wheat half-seeds was shown to activate monophenolase and alter its molecular properties through a change in the conformation of the enzyme molecules. A GA_3-binding protein was purified and this hormone-protein complex was found to bind to acid phosphatase and concomitantly bring about enzyme activation. His pioneering work on the selective phosphorylation of the small subunit of RuBPCase in spinach and moss has unravelled the significance of phosphorylation in the assembly of large and small subunits into holoenzyme. His group has also been the first to report phosphorylation at tyrosine residues during autophosphorylation of wheat protein kinase.

Positions: Professor, Department of Botany, University of Delhi (1978-); Biochemist, Division of Biochemistry, India Agricultural Research Institute, New Delhi (1968-78).

Learned and Professional Societies: Life Member, International Society of Plant Morphologists and Society of Biological Chemists, (India).

Address: Professor, Department of Botany, University of Delhi, Delhi 110 007; Tel: (011) 7257573; Res: E-14/4, Vasant Vihar, New Delhi 110 057; Tel: (011) 678837.

SACHDEV, Purushottam Lal

Elected 1990

Born 6 January 1937; Pattoki, Pakistan
Ph.D.(1967), Indian Institute of Science (IISc), Bangalore

Specialization: Applied Mathematics

Research Achievements: Some of Sachdev's important contributions are in: chaotic motion of dynamical systems; nonlinear ordinary differential equations and their applications; exact solutions of nonlinear problems with awkward boundary conditions; nonlinear diffusive waves; transonic flow past an aerofoil -- solution of a nonlinear singular integral equation involving shocks; and intense (nuclear) explosions in the atmosphere.

Positions: Professor, Department of Mathematics, IISc, Bangalore (1982-); Visiting Professor, University of Waterloo, Canada (1987); and New Jersey Institute of Technology, USA (1989-90).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India).

Author/Editor Facet: Published two books: 'Nonlinear Diffusive Waves' (CUP, 1987) and 'Nonlinear Ordinary Differential Equations and Their Applications' (Marcel- Dekker, 1991); member, editorial boards of: *Chaos, Solitons and Fractals*: Applications in Science and Engineering; and *Indian J. Pure Appl. Math.*

Policy-making Bodies: Member, UGC Mathematics Panel, Mathematical Science Research Committee, CSIR.

Address: Professor, Department of Mathematics, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2267); Telex: 845-8349 IISc.IN; Fax: 91-80- 341683; E-mail: sachdev@math.iisc.ernet.in; Res: 413, R.T. Nagar, I Block, Bangalore 560 032; Tel: (080) 335934.

SADASIVAN, Toppur Seethapaty

Elected 1955

Born 22 May 1913; Madras, Tamil Nadu
D.Sc. (1955), University of London, UK

Specialization: Physiological Plant Pathology

Research Achievements: Using model host-parasite systems, Sadasivan's group specialized in studying physiology and biochemistry of the diseased plant and, in particular, demonstrated ionic imbalance and loss of permeability of toxin invaded-plant tissues.

Positions: Consultant to CSIR on Plant-based Laboratories; Professor of Botany and Director, Centre for Advanced Studies in Botany, University of Madras (1944-73).

Learned and Professional Societies: Fellow, Indian Botanical Society, Indian Phytopathological Society, Indian Academy of Sciences, and Deutsches Akademie der Naturforsch (Germany); Member, INSA Council (1958-59, 1962-64, 1971-73).

Awards and Honours: Birbal Sahni Medal; Sunder Lal Hora Medal (INSA) (1973); Shanti Swarup Bhatnagar Prize (1960); Padma Bhushan (1974).

Lectureships: Birbal Sahni Lecture.

Author/Editor Facet: Served as editor, *J. Indian Bot. Soc.;* member, editorial board, *Phytopathol. Z. Berlin.*

Other Contributions: Established a School of Physiological Plant Pathology at University of Madras.

INSA has instituted 'Professor T.S. Sadasivan Lecture Award' in 1982 in his honour.

Address: Gokulam, 86/1. M.K. Amman Koil Street, Mylapore, Madras 600 004; Tel: (044) 847181.

SADHU, Dulal Pada

Elected 1966

Born 9 May 1916; Kapilmuni, Bangladesh
Ph.D. (1947), University of Missouri, USA; D.Sc. *(h.c.)* (1984), Bidhan Chandra Agricultural University, West Bengal

Specialization: Physiology & Nutrition, Endocrinology, Biology of Reproduction and Cell Biology

Research Achievements: Sadhu has made contributions to our knowledge of the mechanism of specific dynamic action of food, a much disputed area of physiology and biochemistry. He has unravelled the mechanisms of energy exchange in the living organism, e.g. specific dynamic action of food, and evolution of thermoregulation in the animal kingdom. Also worked on thyroid physiology, cholesterol metabolism, the physiological mechanism of action of vitamin A, the nutritional significance of milk sugar, and the kwashiorkor syndrome. He has done work on animal ecology with respect to temperature and neurochemistry.

Positions: Emeritus Scientist and Professor of Physiology and Nutrition, Bengal Veterinary College, Calcutta; Principal, Bengal Veterinary College (1964-74), P.G. College of Animal Sciences, IVRI; Professor of Veterinary Physiology (1953-60), Assistant Professor in Physiology (1948-52), Bengal Veterinary College; Senior Scientific Officer (Defence Ministry) in Physiology, Kanpur.

Learned and Professional Societies: Fellow, National Academy of Sciences (India); Member, Sigma Xi and Societe de chimie biologique, (France); President, Science Club, (Calcutta); Member, INSA Council (1972-74).

Awards and Honours: President, Physiology Section, Indian Science Congress (1963).

Author/Editor Facet: Authored a book dealing with 'Progress in Physiology in India'.

Address: Emeritus Scientist, Bengal Veterinary College, Calcutta 700 017; Tel: (033) 563165; Res: 506, Paranasreepalli, Calcutta 700 060; Tel:(033) 775408.

SAHA, Ajit Kumar

Elected 1959

Born 31 August 1922; Calcutta, West Bengal
D.Sc. (1946) University of Calcutta

Specialization: Nuclear Physics, Solid State Physics

Research Achievements: Saha initiated research on nuclear spectroscopy in India and laid the foundation of the Theoretical Nuclear Physics Division at Saha Institute. He constructed a magnetic lens spectrometer for ß-ray spectroscopy, the first NMR spectrometer, spin-echo spectrometer, and the first NQR spectrometer as well as a goniometer as an adjunct to it. He also built up research groups at the Institute on microwave spectroscopy, ESR and solid-state physics, both experimental and theoretical. The Crystallographic and Molecular Physics Division and the Regional Scientific Instrument Centre were also his creations at the Institute. Also standing to Saha's credit is the post- M.Sc. course in nuclear physics, solid-state physics and bio- physics at the Institute.

Positions: Director, Bose Institute, Calcutta; Senior Professor, Saha Institute of Nuclear Physics, Calcutta.

Learned and Professional Societies: Fellow, National Academy of Sciences (India); Member (Council), Indian Association for the Cultivation of Science.

Awards and Honours: 1851 Exhibition Scholar; Mouat Medal (University of Calcutta) (1950); President, Indian Science Congress (1980).

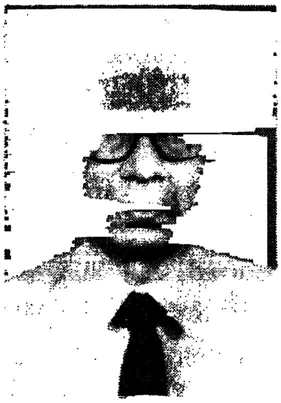
Author/Editor Facet: Co-authored a book entitled 'Theory and Applications of Nuclear Induction'.

Other Contributions: Saha had deep interest in archaeology, ancient and medieval history, history of science, technology and chronology.

Died 1 March 1991.

SAHA, Ajit Kumar

Elected 1968



Born 25 May 1925; Patna, Bihar
D.Phil. (1958), University of Calcutta; Ph.D. (1958), Universty of Toronto, Canada

Specialization: Petrology, Geochemistry, Precambrian Geology, Environmental Geology

Research Achievements: Saha has deciphered the Precambrian crustal evolution of the Singhbhum - north Orissa region, discovering 3.7 Ga relics (the oldest known so far in India); pioneered in India the application of statistical techniques to understand the processes involved in genesis of granitic rocks and ore deposits; and also pioneered multi- disciplinary research on the environmental problems of eastern India.

Positions: CSIR Emeritus Scientist (1990-93), Professor of Geology (1962-90), Head, Department of Geology (1978-85), Presidency College, Calcutta.

Learned and Professional Societies: Founder-Member (now Chairman), Indian Society of Earth Sciences; Fellow, Indian Academy of Sciences and Geological, Mining & Metallurgical Society of India; Life Fellow, Geological Society of India;

Founder-Member and Hony Secretary, Centre for Study of Man and Environment (1978-); Member, International Association of Mathematical Geology; Member, INSA Council (1974-76).

Awards and Honours: National Mineral Award (1969); UGC National Lecturer (1970).

Lectureships: Hemchandra Dasgupta Memorial Lecture (Geological, Mining & Metallurgical Society of India) (1986).

Author/Editor Facet: Co-authored two books, edited one book; editor, Geological Mining & Metallurgical Society of India (1966- 72), and *Indian J. Earth Sci.* (1987-); member, editorial board of *Comput. Geosci.* and *Math. Geol.* (1980-91).

Policy-making Bodies: Corresponding Member, IUGS Subcommission on Precambrian Stratigraphy; Member, Indian National Committee of IUGS; served on various committees of DST, CSIR, UGC, GSI, etc.

Other Contributions: Saha has played a leading role in the development and growth of earth sciences in India.

Address: Emeritus Professor, Department of Geology, Presidency College, Calcutta 700 073; Tel: (033) 3590781; Res: 4C, Sitaram Ghosh Street, Calcutta 700 009; Tel: (033) 2411378.

SAHA, Amulya Kumar

Elected 1983

Born 9 January 1913; Pabna, Bangladesh
D.Sc. (1968), University of Calcutta

Specialization: Morphology and Anatomy

Research Achievements: Saha's significant achievements relate to: glenohumeral joint; formulation and application of 'zeroposition'; dynamic stability: glenohumeral joint and shoulder girdle; kinematics and kinetics; functional classification of muscles; surgical rehabilitation for paralyzed and flail shoulder; pathomechanics; evaluation and a new approach to surgical corrections of recurrent dislocation; physiological prosthetic partial and total glenohumeral joint replacement; flail hip; and innovations in surgery.

Positions: Emeritus Professor, Orthopaedic Surgery (1973-); Hony Professor & Consultant, Orthopaedic Surgery (1965-73); Director- Professor of Surgery (1955-64), Nilratan Sircar Medical College & Hospital, Calcutta.

Learned and Professional Societies: Fellow, Indian Orthopaedic Association, Royal College of Surgeons, England and Edinburgh; Member, Association of Surgeons of India; Emeritus Member, Societe Internationale de Chirurgie Orthopaedie et Traumatologie.

Awards and Honours: Hunterian Professor, (Royal College of Surgeons) (1957); Coates Medal (University of Calcutta) (1967).

Author/Editor Facet: Author of four classic monographs on shoulder anatomy and surgery.

Address: Emeritus Professor, Nilratan Sircar Medical College, Calcutta 700 014; Res: 99/5/15, Ballygunge Place, Calcutta 700 019; Tel: (033) 477778.

SAHA, Meghnad

Foundation Fellow

Born 6 October 1893; Seoratali, Bangladesh
D.Sc. (1918), University of Calcutta

Specialization: Spectroscopy, Astrophysics, Nuclear Physics and Thermodynamics

Research Achievements: Saha would be remembered for ever for his theory of thermal ionization and its application to the interpretation of stellar spectra in terms of the physical conditions prevailing in the stellar atmospheres. Apart from astrophysics, the theory found numerous other important applications such as to the study of the ionosphere, conductivity of flames, electric arcs and explosion phenomena. He initiated and organized research in several subjects such as statistical mechanics, atomic and molecular spectroscopy, experiments on thermal ionization and electron affinity of electronegative elements. The equation that now goes by his name was called 'equation of the reaction isobar for ionization' by him. Saha's researches in astrophysics and physics spanned over a wide range: stellar spectra, thermal ionization, selective radiation pressure, spectroscopy, molecular dissociation propagation of radio waves in the ionosphere, solar corona, radio emission from the Sun, beta radioactivity, and the age of rocks.

Positions: Khaira Professor of Physics, University of Calcutta (1921-23; 1938-53); Professor and Head, Physics Department, University of Allahabad; Hony Director for Life, Institute of Nuclear Physics (now Saha Institute of Nuclear Physics), Calcutta.

Learned and Professional Societies: Fellow, Royal Society of London; President, Indian Association for the Cultivation of Science; first Director of laboratories of the IACS; President, National Academy of Sciences (India) (1932-34) and Asiatic Society (1944- 46); President, INSA (1937-38).

Awards and Honours: President, Indian Science Congress (1934).

Author/Editor Facet: Saha co-authored two books: 'Principles of Relativity' (1919) and 'A Textbook of Heat' (1931), which became a classic; founded *Sci. & Cult.*

Policy-making Bodies: Chairman, Indian Calender Reforms Committee, Council of Scientific & Industrial Research; Member, University Education Commission; Member, National Planning Committee of the Indian National Congress (1938); Member of Parliament (1951).

Other Contributions: Saha established the Physics Department of University of Allahabad as one of the active centres of research.

INSA has instituted 'Meghnad Saha Medal' in his memory.

Died 16 February 1956.

SAHA, Nalini Kanta

Elected 1957

Born 1 January 1908; Satbaria, Bangladesh
Dr. der. Nat. (1938), University of Heidelberg, Germany

Specialization: Nuclear Physics and Nuclear Instruments

Research Achievements: Saha worked on electron theory of metals and pressure effect of electrical resistance of metals based on Nordheim's 'rigid ionic' model with much success. He developed several types of nuclear radiation-measuring instruments. The 'spark-counter', a multiwire sparking system, stands out, perhaps as a precursor of the well-known 'spark chamber'. In later years his interest shifted to the study of the excitation functions of some nuclear reactions and to the measurement of $\gamma\gamma(\theta)$, the directional correlation of $\gamma\gamma$-cascades, in a series of medium heavy nuclei, and to the supporting precision measurements of E_γ, $\gamma\gamma$-coincidence-spectra and τ_γ, the half-life of nuclear excited states. These provide valuable spectroscopic data including the nuclear decay schemes and level-properties and γ-transition probabilities, and point out the difficulties of some of the existing nuclear coupling schemes. He extended the investigations to the study of $\alpha\gamma(\theta)^*$, the perturbed angular correlation of the, α, γ -decays in a thin polycrystalline sample of americum-241. The results throw light on the nature of the perturbing interactions and the internal fields of the solid state sample material.

Positions: Professor of Physics, University of Delhi, Delhi. (Retired).

Learned and Professional Societies: Member, Indian Physical Society and American Physical Society.

Awards and Honours: President, Physics Section, Indian Science Congress (1970).

Author/Editor Facet: Co-author (with Meghnad Saha) of 'A Treatise of Modern Physics' (1934).

Other Contributions: Delivered popular science lectures, especially on atomic science and atomic energy.

Address: I-1697, Chittaranjan Park, Kalkaji, New Delhi 110 019; Tel: (011) 647 1090.

SAHNI, Ashok

Elected 1992

Born 19 August 1941; Calcutta, West Bengal
Ph.D. (1968), Institute of Technology, University of Minnesota, Minneapolis, USA

Specialization: Geology (Vertebrate Palaeontology), Biomineralization, Scanning Electron Microscopy

Research Achievements: Sahni has done extensive work on Himalayan Eocene vertebrates, their application in defining collision history of India and Asia and in the reconstruction of tertiary palaeobiogeography; documentation of Indian dinosaur resting sites, eggshell ultrastructure; biomineralization studies involving recent and calcified fossil tissues; Cretaceous and tertiary mammalian biotechnology; stratigraphy of Deccan volcano- sedimentary sequences; and Cretaceous tertiary boundary events.

Positions: Professor of Palaeobiology (Geology), Panjab University, Chandigarh.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Alexander von Humboldt Foundation, Geological Society of India, and Palaeontological Society of India (Vice-President); Associe. Etranger, Geological Society of France.

Awards and Honours: L. Rama Rao Gold Medal (1990).

Author/Editor Facet: Authored a book, edited two publications and contributed chapters to three volumes (Plenum, Elsevier, and CUP).

Policy-making Bodies: Regional Coordinator and Convener, International Geological Correlation Programme; Member, Indo- US Sub Comm., Science & Technology; Member, International Union of Geological Sciences.

Address: Professor of Geology, Centre of Advanced Study in Geology, Panjab University, Chandigarh 160 014; Tel: (0172) 541740; Telex: 395464 RSIC.IN; E-mail: ashok@imtech.ernet.in; Res: 245, I Floor, Sector 11A, Chandigarh 160 011.

SAHNI, Birbal

Foundation Fellow

Born 14 November 1891; Bhera, Pakistan
D.Sc. (1919), University of London; Sc.D. (1929), University of Cambridge, UK

Specialization: Botany and Palaeobotany

Research Achievements: Sahni made some original contributions to botany, palaeobotany and geology. He made extensive contributions to the structure and affinities of certain zygopterid ferns. Made a study of Indian Gondwana plants along with A.C. Seward, describing a number of entirely new fossil plants and revising several old species and their geological ranges. He also investigated the structure and affinities of various Indian fossil plants from Palaeozoic to the Quaternary beds. Founded a new group of fossil gymnosperms -- Pentoxylae. Also made improvements in the techniques of studying fossil plants.

Positions: Professor of Botany, Banaras Hindu University (1919) and Panjab University, Lahore (1921); Professor and Head, University of Lucknow; first Director, Institute of Palaeobotany, Lucknow.

Learned and Professional Societies: Fellow, Royal Society of London and Asiatic Society; Hony Foreign Member, American Academy of Arts and Sciences; Vice-President, Palaeobotany Section, International Botanical Congress (1935); Vice-President, Indian Academy of Sciences; President, National Academy of Sciences (India) (1943-44); Vice-President,INSA.

Awards and Honours: Barclay Medal (Asiatic Society) (1936); Sir Cattamanchi Ramalinga Reddy National Prize; Nelson-Wright Medal (Numismatic Society)

(1944); President, Botany Section (1921, 1938), Geology (1926) and General President (1940), Indian Science Congress; Hony General President, International Botanical Congress, Stockhlom (1950).

Author/editor Facet: Served on the editorial board of *Chron. Bot.*

Other Contributions: Sahni's gift to palaeobotany is the Institute he founded, named (posthumously) Birbal Sahni Institute of Palaeobotany at Lucknow.

Died 10 April 1949.

SAHNI, Mulk Raj

Elected 1950

Born 1 March 1899, Bhera, Pakistan
D.Sc., University of London, UK

Specialization: Geology, Palaeobotany

Research Achievements: Sahni made extensive contributions to palaeontology and stratigraphy. He carried out field work in the Shan State of Burma and discovered highly fossiliferous Lower Triassic beds. This discovery brought him recognition as one of the foremost palaeontologists of India. Sahni argued that earlier concepts of an effective barrier separating the Indian and the Burmese regions during the early Palaeozic (deduced from the so-called faunal disparities between the two regions and the presumed absence of graptolites from the Indian region) was untenable. Later (1964) he discovered graptolites from Kashmir. Sahani's other researches related to morphology and zonal distribution of British Chalk Terebratubids, and brachial appratus of British Chalk Terebratulids, evolutionary studies on Jurassic and Cretaceous Terebratulids, Mesozoic brachiopods of Baluchistan, discovery of *Eurydesma* and Conularia from Eastern Himalayas; Argentine and Australian affinities of Lower Permian faunas from Central India, discovery of a Cretaceous nautiloid mandible from South India and first record of *Orbitolina* from the Indian subcontinent.

Positions: Superintending Geologist and Palaeontologist, Deputy Director and Acting Director, Geological Survey of India.

Learned and Professional Societies: President. Palaeontological Society of India; Member, INSA Council (1963-65).

Awards and Honours: President, Geology Section Indian Science Congress (1941).

Author/Editor Facet: Sahni wrote a monograph on 'Terebratulidae of The British Chalk' (Palaeontological Society of London, 1929).

Died 13 January 1983.

SAKSENA, Ram Kumar

Elected 1952

Born 16 August 1897; Orai, Uttar Pradesh
D.Sc. (1935), University of Sorbomne, Paris

Specialization: Mycology and Plant Pathology

Research Achievements: Saksena was deeply interested in mycology and plant pathology. He made a study of extra- nuclear cytology, particularly of mitochondria. Carried out detailed studies on various soil and aquatic fungi. His other areas of interest were physiology, taxonomy and cytology of the orders Peronosporales and Saprolegniales. He also did some significant work on Mucorales and soil fungi. Several mycologists named various species after him and created a genus *Saksenaea* in Mucorales.

Positions: Professor and Head, Department of Botany, University of Allahabad, Allahabad.

Learned and Professional Societies: President, Indian Botanical Society and Indian Phytopathological Society; Founder Member and President, National Academy of Sciences (India).

Awards and Honours: Birbal Sahni Gold Medal (1968); President, Botany Section, Indian Science Congress (1953).

Lectureships: Mundkur Memorial Lecture/Award (Indian Phytopathological Society) (1967).

Died 1 September 1970.

SAKSENA, Shyam Bahadur

Elected 1972

Born 10 August 1917; Jabalpur, Madhya Pradesh
Ph.D. (1955), University of Saugor, Sagar

Specialization: Mycology and Plant Pathology

Research Achievements: Saksena worked on the ecology of soil fungi with respect to teak forests of Madhya Pradesh. He introduced the concept of frequency, abundance and density in studying the mycoflora of forest soils and succeeded in correlating edaphic factors with association of mycoflora and the vegetation types. This became a model for study of all tropical forests. Contributed to the study of biological control of soilborne pathogens. Described many new genera and species, specially *Saksenaea vesiformis*, which constituted a new family of fungi. Later, this proved to be a virulent human pathogen. He also worked on various aspects of root diseases and fruit and vegetable rots.

Positions: Professor of Botany, University of Saugor, Sagar; Visiting Professor, School of Studies in Botany, Jiwaji University, Gwalior.

Learned and Professional Societies: Fellow, National Academy of Sciences (India); Member, American and British Mycological Societies, Indian Botanical Society (President 1971), Indian Phytopathological Society (President 1975), and Indian Mycological Society (President 1978).

Awards and Honours: President, Botany Section, Indian Science Congress (1978).

INSA has instituted 'Professor Shyam Bahadur Saksena Memorial Award'.

Died 21 March 1988.

SALIM ALI, Moizuddin Abdul

Elected 1958

Born 12 November 1896; Bombay, Maharashtra
D.Sc.(*h.c.*), Aligarh Muslim University (1958), University of Delhi (1973), and Andhra University, Waltair (1978)

Specialization: Ornithology, Nature Conservation

Research Achievements: Trained in systematic ornithology under Erwin Stresemann at Berlin University Zoological Museum (1929- 30), Salim Ali conducted ornithological expeditions in most of the unexplored and little-known parts of the Indian subcontinent, including the western Himalayas, Sikkim, Bhutan and Arunachal Pradesh as well as in western Tibet and Afghanistan. His expeditions also spanned Burma and Malaya.

Positions: President, Bombay Natural History Society.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Hony Fellow, American Ornithologists' Union; Hony Member, Deutsches Ornithologen-Gesellschaft, Societe' Ornithologique de France, British Ornithologists' Union (1967), and Sociedad Espanola de Ornithologia; Corresponding Member, Zoological Society, London; Member, INSA Council (1967).

Awards and Honours: Joy Gobind Law Memorial Medal (Asiatic Society) (1953); Gold Medal (British Ornithologists' Union) (1967); John Phillips Memorial Medal (International Union for Conservation of Nature and Natural Resources) (1969); Sunder Lal Hora Medal (INSA) (1970); Pavlovsky Centenary Memorial Medal (USSR Academy of Medical Sciences) (1973); Officer in the Order of the Golden Ark (H.R.H. Prince Bernhard of The Netherlands) (1973); Paul Getty International Prize (1976); Chandrasekhara Venkata Raman Medal (INSA) (1979); Asiatic Society of Bangladesh Gold Medal (1981); Rabindra Nath Tagore Plaque (Asiatic Society) (1981); National Research Professorship in Ornithology (1982); International Conservation Award, National Wildlife Federation (USA) (1983); National Conservation Award, (Indian Board for Wildlife); Padma Bhushan (1958); Padma Vibhushan (1976).

Author/Editor Facet: A prolific author, Salim Ali wrote many books of lasting value. To mention a few : 'The Book of Indian Birds' (Bombay Natural History Society, 1941, 11 edns), 'The Birds of Kutch (OUP, 1945), 'Indian Hill Birds' (OUP, 1949), 'The Birds of Travancore & Cochin' (OUP, 1953; 2nd edn as 'Birds of Kerala' (1969), 'Handbook of the Birds of India and Pakistan' (with S. Dillon Ripley) in 10 vols (OUP, 1968-74), 'Field Guide to the Birds of the Eastern Himalayas' (OUP, 1977).

Other Contributions: Salim Ali was an explorer of Francis Bacon's genre, a rarity in twentieth-century science.

Died 20 June 1987.

SANDHU, Sarjit Singh

Elected 1982

Born 7 February 1930; Faislabad, Pakistan
Ph.D. (1963), University of London, UK

Specialization: Inorganic Chemistry, Coordination Chemistry

Research Achievements: A specialist in structural and coordination chemistry, organometallic chemistry, bioinorganic chemistry and photochemistry, Sandhu has achieved stabilization of copper(II) bond with arsenic(III) by using Ortho-carboxyphenyl tertiary arsines. Investigated the photochemical reduction of uranyl ion with triorganopnictides and diorganochalcogenides and proposed mechanisms on the basis of kinetic and product analysis data. Studied diorganotin(IV) complexes of oxygen donors using infrared, NMR and Mössbauer spectroscopy to assign coordination number and structure. Prepared and characterized complexes of transition metal ions with newly synthesized model bioheterocyclic systems as well as protected amino acids and dipeptides. Assigned correct structures to model bioheterocyclic systems on the basis of X-ray diffraction studies.

Positions: Professor and Head, Chemistry Department, Guru Nanak Dev University, Amritsar (1971-80).

Learned and Professional Societies: Fellow, National Academy of Sciences (India); Member, Indian Chemical Society.

Address: C-17, Guru Nanak Dev University, Amritsar 143 005; Tel: (0183) 65758.

SANE, Prafullachandra Vishnu

Elected 1991

Born 24 December 1937; Chiplun, Maharashtra
Ph.D. (1968), University of Alberta, Canada

Specialization: Plant Biochemistry, Photosynthesis, Molecular Biology

Research Achievements: Sane has contributed to the understanding of the structure-function relationship of the thylakoid membranes of chloroplasts, their architecture and the phenomenon of delayed light emission. He identified energy storage states as well as redox pairs participating in light emission and contributed to the understanding of plant enzymes and their regulation. Established a group on Plant Molecular Biology to undertake basic and applied research.

Positions: Director, Acting Director, Deputy Director, National Botanical Research Institute, Lucknow (1984-); Scientist, Bhabha Atomic Research Centre, Bombay

(1972-83); Assistant Director, Indian Standards Institution (now Bureau of Indian Standards) New Delhi (1961-64).

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Indian Academy of Sciences, National Academy of Agricultural Sciences (India), and Maharashtra Academy of Sciences; Life Member, Indian Photobiology Society and Society for Plant Physiology and Biochemistry.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1981); Best Scientist of the Year 'Bharat Jyoti' (1991); UGC National Lecturer (1986-87).

Author/Editor Facet: Member, editorial boards of: *J. Sci. Ind. Res., Plant Physiol. Biochem.,* and *Indian J.Exp.Biol.*; served as member of editorial committee for *Proc. Int. Cong. Plant Physiol.* (1988).

Policy-making Bodies: Member of several CSIR, DST, DBT committees; was member of UNEP Project on Primary Productivity; National and Regional Coordinator of Commonwealth Science Council Programmes on Biological Diversity and Genetic Resources.

Address: Director, National Botanical Research Institute, Rana Pratap Marg, Lucknow 226 020; Tel: (0522) 246069; Res: F-4, CSIR Colony, Nirala Nagar, Lucknow 226 020; Tel: (0522) 72201.

SANTAPAU, Rev. Fr. Hermenegild

Elected 1953

Born 5 December 1903, Spain
Ph.D. (1927), Gregorian University; Ph.D., University of London, UK

Specialization: Botany, Taxonomy

Research Achievements: Santapau carried out botanical explorations in the Central Cevennes, France (1926), Eastern Pyrenees (1934), the Italian Alps (1936), Baluchistan(1946), Kathiawar (1946-54) and the Dangs Forest (1950-55). In India he explored the Western Ghats from Kaiyat and Khandala down to Goa and the Eastern Ghats from Waltair to Vijayawada, the Pulneys and the Nilgiris. Also explored the north-east and northern regions - the Khasia and Jaintia Hills in Assam, Darjeeling and Kalimpong and Dehra Dun and Mussoorie. Collected some 100,000 botanical specimens, which are preserved in Bombay, Kew (London), Arnold Arboretum of Harvard University, Missourie Botanical Garden and other national and international herbaria.

Positions: Staff Member, Royal Botanic Gardens (Kew), St Xavier's College (Bombay) (1940); Chief Botanist (1955) and Director (1961-68), Botanical Survey of India.

Learned and Professional Societies: Fellow, Linnaean Society (London) and Indian Botanical Society (President 1955); Member, Asiatic Society, Botanical Society of Bengal (President, 1965- 66), Bombay Natural History Society (Vice-President, 1950-68), Phytopathological Society of India, International Society of Phytomorphology, International Association for Plant Taxonomy, and International Association of Botanical Gardens; Hony Life Member, Royal Agricultural and Horticultural Society of Bengal.

Awards and Honours: President, Botany Section, Indian Science Congress (1965); Birbal Sahni Gold Medal (1964); Order of Alphonso X, the Wise; Padma Shri (1967).

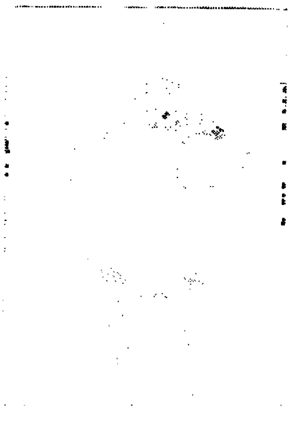
Author/Editor Facet: Santapau was a prolific writer; to mention a few of his books: 'The Flora of Khandala in the Western Ghats of India', (1953) 'The Flora of Saurashtra' (1962), 'The Orchids of Bombay' (1966), and 'Common Trees' (1966); served as editor of Bombay Natural History Society's publications.

Policy-making Bodies: A father figure of Indian botany, Santapau served on several committees of CSIR and its constituents, and ICMR.

Died 13 January 1970.

SANTAPPA, Mushi

Elected 1971



Born 2 October 1923; Jonnagiri, Andhra Pradesh
Ph.D. (1949), University of London, UK; Ph.D. (1951), University of Manchester, UK; D.Sc. *(h.c.)*, Andhra University, Waltair

Specialization: High Polymer Chemistry and Physics, Leather Science and Technology

Research Achievements: Santappa's contributions relate to oxidation of organic substrates and polymerization of vinyl monomers by heavy metal ions, kinetics of vinyl polymerization, solution properties of polymers by light scattering technique, evaluation of stability constant of inorganic complexes involving heavy metal ions and two or three ligands consisting of amino acids. He has also done much work on the science and technology of leather.

Positions: Professor of Chemistry, University of Madras; Vice- Chancellor, S.V. University, Tirupati; Director, Central Leather Research Institute, Madras; and Vice-Chancellor, University of Madras, Madras.

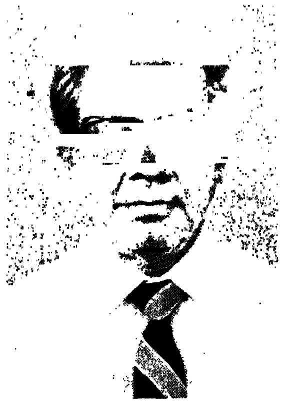
Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences, (India), Tamil Nadu Academy of Sciences, Andhra Pradesh Academy of Sciences, Royal Institute of Chemistry (London), and Indian Chemical Society; Member, INSA Council (1973-75).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1967); UGC National Lecturer (1967); FICCI Award (1987); Sir J.C. Ghosh Memorial Medal (Indian Physics Society); Distinguished Scientist Award (Andhra Pradesh Academy of Sciences).

Address: Scientific Adviser, Tamil Nadu Pollution Control Board, No. 25, Dr. Radhakrishnan Salai, Madras 600 004; Tel: (044) 848332; Res: No. 73, III Main Road, Kasturba Nagar, Adyar, Madras 600 020; Tel: (044) 415163.

SANYAL, Gitindra Saran

Elected 1976



Born 1 February 1922; Dhubri, Assam
M.Sc. (1943), University of Calcutta

Specialization: Microwave Engineering, Optical Fibres

Research Achievements: A pioneer in microwave engineering in India, Sanyal developed a new and sensitive technique for studying diffraction phenomena in antennas and the microwave behaviour of ferromagnetic materials in the 3cm region. His work attracted world-wide attention. His contributions to the study of microwave diffraction phenomena on the inclined open end of a waveguide, on curved aperture, and slots and Fresnel zone plates have far- reaching fundamental and practical implications. His investigations on microwave analogue of a crystal are also likely to influence the study of crystal physics. He has developed a new method of studying propagation through optical fibres of arbitrary cross- sections.

Positions: Managing Director, Technology Foundation, Executive Director, Science & Technology Enterpreneurs Park (STEP), Professor, Department of Electronics and Electrical Communication Engineering; Head, Centre for Research and Training in Radar and Communication, all at Indian Institute of Technology, Kharagpur.

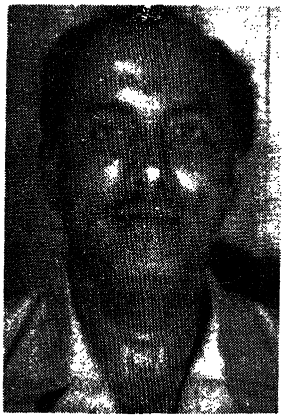
Learned and Professional Societies: Fellow, Institution of Engineers (India) and Institution of Electronics and Communication Engineers (India).

Awards and Honours: J.C. Bose Memorial Award (1970); M.N. Saha Memorial Award (1974); Ramlal Wadhawa Gold Medal (Institution of Electronics and Telecommunication Engineers) (1978); UGC National Lecturer (1978); Homi J. Bhabha Award (1979); P.C. Mahalanobis Medal (INSA) (1990).

Address: Managing Director, Technology Foundation, Indian Institute of Technology, Kharagpur 721 302; Tel: (03222) 2221 to 2224 (Ext 3224); Res: A-28, Indian Institute of Technology, Kharagpur 721 302; Tel: (03222) 2221 to 2224 (Ext 6399).

SANYAL, Suhas Chandra

Elected 1988



Born 1 January 1942; Mymensingh, Bangladesh
Ph.D. (1969), University of Calcutta; M.D. (1974), Banaras Hindu University, Varanasi

Specialization: Medical Microbiology

Research Achievements: Sanyal elucidated the immune mechanism and developed the first live oral cholera vaccine. Discovered a new toxin (NCT) produced by all cholera vibrios and showed that either cholera toxin or NCT or both can cause the disease. Established several bacteria, not recognized previously, in the aetiology of diarrhoea. Developed many microbiological and epidemiological tools and experimental models.

Positions: SeniorConsultant & Head of Microbiology, Ibn Sina and other Specialized Hospitals, Ministry of Health, Kuwait (1992-); Professor & Head, Department of Microbiology, Institute of Medical Sciences, Banaras Hindu University, Varanasi (1979-); Senior International Scientist, International Centre for Diarrhoeal Diseases Research (ICDDR, B), Dhaka, Bangladesh (1981- 83); Visiting Professor, Karolinska Institute, Stockholm & Biomedicum,. Uppsala, Sweden (1978, 1979), Bundesgesundheitsamtes, Berlin, Germany (1980, 1981 and 1983), University of Brussels, Belgium (1983), Centre Medical Universitare, Geneva, Switzerland (1983), PGI, Chandigarh (1985, 1987), JIPMER, Pondicherry (1987).

Learned and Professional Societies: Fellow, Royal College of Pathologists (London), Royal Society of Tropical Medicine & Hygiene (London), International Medical Sciences Academy, (New Delhi), and Indian Academy of Sciences.

Awards and Honours: Shakuntala Amirchand Award (ICMR) (1970); Dr. S.C. Agarwal Award (Indian Association of Medical Microbiologists) (1980); Ranbaxy Research Award (1991); Dr. V.R. Khanolkar Oration Award (National Academy of Medical Sciences, India) (1992); Dr. Bashambaranath Chopra Memorial Lecture Award (INSA), (1992).

Author/Editor Facet: Member, editorial board, *J. Med. Microbiol., Rev. Med. Microbiol.,* and *J. Diarr. Dis. Res.*

Policy-making Bodies: Member, International Committee on Systematic Bacteriology, IUMS (1974-); Founder Member, International Working Group of Vibrios (1982-); Member, Scientific Working Committee on Enteric Infections, WHO, Geneva (1984-); Secretary-General (1987-90), President (1990-93), Asia Pacific Section of International Society on Toxicology; Member, Advisory Board, International Diarrhoeal Disease Information and Documentation Centre (IDRC, Canada) at Dhaka; Advisor to many national (ICMR, CSIR, DST, and DBT) and international (WHO, ICDDR, B) bodies in relation to control of diarrhoeal diseases and vaccine development.

Other Contributions: Established an Enteric Infection Unit at BHU.

Address: Senior Consultant & Head of Microbiology, Ibn Sina & other Specialized Hospitals, P.O. Box: 25427, 13115 Safat, Kuwait; Fax: 4840838; Tel: (Off) 4834782; (Res) 4893093.

SARABHAI, Vikram Ambalal

Elected 1963

Born 12 August 1919, Ahmedabad, Gujarat
Ph.D. (1947), University of Cambridge, UK

Specialization: Nuclear Physics, Cosmic Rays

Research Achievements: Sarabhai was primarily concerned with the time variations of cosmic rays. He inferred that meteorological effects could not entirely account for the observed daily variations of cosmic rays and that these effects would be estimated and corrections applied to cosmic ray time variations. He was a pioneer in space research in India and was responsible for the setting up of the Space Science and Technology Centre near Thumba and an Experimental Satellite Communication Earth Station at Ahmedabad. Sarabhai envisioned the tremendous scope of research in space science to address to the country's problems in communication, education, meteorology, geodesy, remote sensing and other areas.

Positions: Director, Professor of Cosmic Ray Physics, Physical Research Laboratory (PRL), Ahmedabad; Chairman, Indian Space Research Organization (1962-71) and Atomic Energy Commission (1966-71), Government of India.

Learned and Professional Societies: Member/Fellow, Indian Academy of Sciences, International Geophysical Union; Cambridge Philosophical Society, Physical Society (London); Member, INSA Council (1967-68).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1962); President, Physics Section, Indian Science Congress (1962), Indian Geophysical Union (1970-71), and 14th IAEA Conference; Vice-President, Fourth UN Conference on Peaceful Uses of Atomic Energy; Padma Bhushan (1966); Padma Vibhushan (1972-posthumous).

Policy-making Bodies: Member, Scientific Advisory Committee to the (Union) Cabinet; Member, Cosmic Ray Commission, IUPAP.

Other Contributions: Architect of PRL, Sarabhai put India on the world map of space science and technology. He was also instrumental in setting up the Ahmedabad Textile Industry's Research Association, Indian Institute of Management, (Ahmedabad), and Vikram Sarabhai Community Science Centre. 'A rare combination of an innovative scientist, a progressive industrialist, a humanist and a visionary'.

Died 31 December 1971.

SARKAR, Jaladhi Kumar

Elected 1973

Born 1 August 1916; Burdwan, West Bengal
M.B., University of Calcutta; Dip. Bact., University of London, UK; Ph.D. (1958), University of Calcutta

Specialization: Virology and Bacteriology

Research Achievements: Sarkar is credited with the first publication in India on antibiotic resistance of bacteria and on pathogenic *E.coli.* He showed that smallpox virus strains vary in virulence; asymptomatic carriers can spread smallpox. Virologically proved smallpox and chicken-pox in the same patient, while studying Dengue Haemorrhagic Fever (DHF). Sarkar developed an animal model to prove pathogenesis and also proved that Chikungunya virus can cause DHF. In the field of leprosy, he isolated a new variety of propioni- bacterium from leprous skin and established its aetiological role.

Positions: Director and Professor of Virology, School of Tropical Medicine, Calcutta; Specialist in Pathology, Indian Army.

Learned and Professional Societies: Fellow, National Academy of Medical Sciences (India) and Indian Virological Society.

Awards and Honours: Coate's Medal (University of Calcutta) (1965); Barclay Medal (Asiatic Society) (1993).

Lectureships: Y.S. Narayana Rao Oration (ICMR) (1969).

Author/Editor Facet: Authored 'Sri Ramakrishna's Physician, Dr. Mahendralal Sarkar'; editor, *Udbodhan*; member, editorial/advisory boards of: *Appl. Med., Ann. Indian Acad. Med. Sci.*

Policy-making Bodies: Member, WHO Expert Advisory Panel on Virus Diseases and WHO Expert Committee on DHF; WHO Consultant on Smallpox; Member, Scientific Advisory Board, International Haemorrhagic Fever Foundation.

Address: 87, Golf Club Road, Calcutta 700 033 Tel: (033) 4743765.

SARKAR, Pulin Bihari

Elected 1935

Born 22 November 1895

Specialization: Chemistry

Research Achievements: Sarkar did pioneering work on the chemistry of europium, gadolinium and scandium. Did extensive work on chemical homology and isomerism. Also did some work in analytical chemistry.

Positions: Professor, Department of Chemistry, University College of Science and Technology, University of Calcutta, Calcutta.

Died 9 September 1971.

SARKAR, Pulin Bihari

Elected 1946

Born 1 March 1906; Nowla, Bangladesh
D.Sc. (1936), University of Dacca, Bangladesh

Specialization: Applied Chemistry, Chemical Technology

Research Achievements: Sarkar specialized in the technology of jute fibre and made significant contributions to the chemistry of jute lignin.

Positions: Professor of Chemistry, Vidyasagar College, Calcutta (1939-39); Senior Research Chemist (1939-50) and Director (1950- 67), Jute Technological Research Laboratory, Calcutta.

Awards and Honours: J.M. Das Gupta Memorial Medal (Indian Chemical Society) (1934); P.C. Ray 70th Birthday Memorial Medal (Indian Chemical Society) (1936).

Author/Editor Facet: Wrote a text book on 'Organic Chemistry'.

Died 23 March 1983.

SARKAR, Samarendra Nath

Elected 1974

Born 22 April 1920; Calcutta, West Bengal
Ph.D (1948), University of Edinburgh, UK

Specialization: Precambrian Stratigraphy, Tectonics and Geochronology

Research Achievements: Sarkar has investigated the stratigraphy, structure, petromineralogy, and geochronolgy of the Precambrian of (i) Bhandara Drup-Balaghat Distt. of over 6000 sq.km area covering Sansar, Sakoli-Dongargarh belts (900 Ma-2500 Ma old samples); (ii) Singhbhum-Keonjhar, Sundergarh region covering 10,000 sq.km (900 -3800 Ma old rocks); (iii) crystalline nappe zone in Garhwal and Kumaon Himalayas, Nainital, and Ranikhet- Almora-Baijnath-Lansdowne; and (iv) structural control of copper ore deposits, isotope geology, fluid inclusions, trend surface analysis, electron microprobe work, and isotope studies for genesis. As a result of Sarkar's findings, many textbooks on stratigraphy had to be modified.

Positions: Director/ Vice-Chancellor, Indian School of Mines (ISM), Dhanbad (1969-72); Senior Professor and Head, Applied Geology Department (1961-80); Geologist, Assistant Professor of Geology, Indian Institute of Technology, Kharagpur (1952- 61); Geologist, Geological Survey of India (1949-52); Visiting Professor, Moscow, Leningrad and Kiev Universities (1973).

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Memeber, INSA Council (1976-78);

Awards and Honours: First National Mineral Award (1969); Holland Memorial Medal (1984-85); P.N Bose Memorial Gold Medal (1982).

Author/Editor Facet: Authored two books: 'Precambrian Stratigraphy and Geochronology of Peninsular India' (1968) and 'Geology and Geochemistry of Sulphide Ore Bodies and Associated Rocks in Mosaboni-Rakha Mines Sections in the Singhbhum Copper Belt' (ISM Diamond Jubilee Monograph).

Policy-making Bodies: India's Representative Member, Subcommission on Precambrian Stratigraphy of IUGS (1966-91); Member, Subcommision on 'Oldest Rocks of the World' (1986-).

Address: 95-A Ballygunj Gardens, Calcutta 700 029; Tel: (033) 440 8802.

SARKAR, Sasankha Sekhar

Elected 1959

Born 30 March 1908; Moydah, West Bengal
D.Sc. (1948), University of Calcutta

Specialization: Anthropology

Research Achievements: Sarkar initially took part in the excavations at Harappa and Mohenjodaro. He studied 100 pairs of German twins, the results were published as a Memoir of INSA. Carried out intensive field work among the aborigines of Bengal, Bihar, Assam, and Andaman and Nicobar Islands.

Positions: Professor, Department of Anthropology, Government of India, Indian Museum, Calcutta; worked also with Census of India.

Learned and Professional Societies: Fellow, Anthropological Society of India.

Awards and Honours: President, Anthropology and Archaeology Section, Indian Science Congress (once); Griffith Memorial Prize (University of Calcutta) (1938).

Author/Editor Facet: Authored many books, the most important of them being 'Ancient Races of Deccan'.

Died 9 March 1969.

SARMA, Padubidri Subbaraya

Elected 1962

Born 29 October 1917; Kasargod, Kerala
Ph.D. (1946), University of Wisconsin, USA

Specialization: Biochemistry

Research Achievements: Sarma's contributions relate to intermediary metabolic processes in conversion of tryptophan to niacin, role of B-vitamins and phospho-proteins, as well as the use of radioactive isotopes (^{14}C,^{32}P,^{131}I), in biochemical investigations. Sarma's research interests were on two main lines: (i) inter-relationships of trace elements in a variety of living systems, which laid the foundation for investigations on regulatory aspects of the biosynthesis of haeme and its involvement in drug metabolism; and (ii) etiology of neurolathyrism,a crippling disease due to the continued consumption of seeds of *Lathyrus sativus* (kesari dal).

Positions: Professor of Biochemistry, University of Madras; Chairman, Department of Biochemistry, Indian Institute of Science, Bangalore.

Learned and Professional Societies: Fellow, Royal Institute of Chemistry (London) and Indian Academy of Sciences; Member, American Institute of Nutrition, Society of Experimental Biology and Medicine (USA), and Society of Biological Chemists (India) (President, 1962-64).

Awards and Honours: Curzon Prize (University of Madras) (1941); G.J. Watumull Award (1965).

Author/Editor Facet: Member, editorial board of *Indian J. Biochem.* (now *Indian J. Biochem. Biophys.*).

ies: Associated with technical committees of CSIR, UGC and NCERT.

Other Contributions: Sarma endeavoured to raise the standard of teaching biochemistry in universities.

Died 8 September 1970.

SARMA, Vallury Visweswara Subrahmanya

Elected 1990

Born 7 May 1944; Vijayawada,Andhra Pradesh
Ph.D. (1971), Indian Institute of Science (IISc), Bangalore

Specialization: Computer Science

Research Achievements: Sarma has contributed to the theory of pattern recognition involving feature measurement costs, fuzzy features, plan-based architectures, and decision tree classifiers and demonstrated the use of speech for establishing the identity of speakers. Developed models of maintenance for aircraft fleet based on queuing theory and control theory, and established decision support tools.

Positions: Professor, IISc, Bangalore (1983-); Visiting Professor, Centre for Advanced Computer Studies, University of South-Western Louisiana, USA (1984-86).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Indian National Academy of Engineering; Senior Member, Institute of Electrical and Electronics Engineers; Senior Member, Computer Society of India.

Author/Editor Facet: Co-authored 'Reliability of Computer and Control Systems' (North-Holland, 1987); member, editorial boards of *J. Indian Inst. Sci., Panitantra*, and *Indian J. Pure Appl. Math.*

Policy-making Bodies: Member, UNU Committee of Information Technology.

Address: Professor, Department of Computer Science and Automation, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2238); Telex: 0845-8349 IISc IN; Fax:91-80- 341683; E-mail: vvs@csa.iisc.ernet.in; Res: 'Siva', No. 2182, 8th Main Road, 'E' Block, Rajajinagar, 2nd Stage, Bangalore 560 010; Tel: (080) 321876.

SARMA, Yeleswarpu Siva Rama Krishna *Elected 1984*

Born 23 September 1922; Guntur, Andhra Pradesh
Ph.D. (1958), University of London, UK

Specialization: Algal Cytotaxonomy and Cytogenetics

Research Achievements: Sarma investigated algal karyology of 438 algal taxa comprising Chlorophyceae, Dinophyceae and Englenineae. Determined chromosome numbers and found that nearly 90% of taxa bore new records. His karyological investigations showed the existence of a variety of life cycle patterns, polyploid races and cytological races. A number of cytotaxonomic investigations

were done critically; cytogenetical studies relate to effect of radiations and certain chemicals on algae. He has carried out morphological and physiological observations on algal taxa, and taxonomical studies on charophytes and freshwater Dinophyceae.

Positions: Head (also Dean of Students), Department of Botany, Banaras Hindu University, Varanasi (Retired).

Learned and Professional Societies: Fellow/Member, Indian Botanical Society (sometime President), Indian Phycological Society, and Linnaean Society (London).

Awards and Honours: Gold Medal (Indian Botanical Society) (1983).

Author/Editor Facet: Co-authored 'Algal Taxonomy in India' (with M.Khan); served on editorial boards of *Cell Chromos. Res.* and *J. Cytol. Genet.*; member of editorial committee *J. Cytol. Genet.*

Policy-making Bodies: Served as member of many UGC Committees.

Address: B-7/12, Sheesh Mahal Colony, Kamachha, Varanasi 221 010.

SASISEKHARAN, Viswanathan

Elected 1980

Born 28 June 1993; Mayavaram, Tamil Nadu
Ph.D. (1959), University of Madras

Specialization: Biomolecular Structure & Function

Research Achievements: Sasisekharan has done significant work on the conformation of biopolymers, specially polynucleotides and polypeptides. Developed incisive methods for arriving at optimal conformation of macromolecules. On the basis of these methods he has suggested a new alternative model for the Watson-Crick double helical structure of DNA.

Positions: Professor, Molecular Biophysics Unit, Indian Institute of Science, Bangalore; Professor of Physics, University of Madras (1971-72); Visiting Professor, Frick Chemical Laboratory, Princeton University, USA (1970-71); Professor and Administrative Head, Department of Physics (1968-

70); Reader, Centre of Advanced Study in Physics, University of Madras (1964-68); Visiting Scientist, Laboratory of Molecular Biology, National Institutes of Health, Bethesda, USA (1963-64).

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1978); FICCI Award (1981); J.C. Bose Medal (INSA) (1983); ASTRA Chair in Biological Sciences (1985); Watumull Honor Summus Medal (USA) (1987); Fogarty Scholar in Residence, NIH (USA) (1988-90); Om Prakash Bhasin Foundation Award (1989); J.C. Bose Award (Hari Om Ashram-UGC) (1985).

Author/Editor Facet: Member, editorial boards of: *Int. J. Biol. Macromol., Indian J. Biochem. Biophys., J. Biomol. Struct. Dynam., J. Biosci.,* and *Curr. Sci.*

Address: Molecular Biophysics Unit, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext) 458; Res: E- 12, New Housing Colony, IISc, Bangalore 560 012; Tel: (080) 349148.

SASTRI, Mylapore Venkatarama Chellappa

Elected 1976

Born 7 May 1915; Rangoon, Burma
Ph.D. (1945), University of Bombay

Specialization: Physical Chemistry, Heterogeneous Catalysis, Solid-State Chemistry, Materials Science, Energy Science

Research Achievements: Sastri has carried out pioneering studies on mixed adsorption of reactants on catalysts under near-reaction conditions and identification of reaction intermediates in the synthesis of hydrocarbons, methanol and ammonia; studies of solid-state chemistry, electronic properties and catalytic behaviour of ternary semiconducting oxides of transition metals leading to structure-activity correlations; and relative roles of electronic and geometric factors in heterogeneous catalysis. He has conducted systematic studies of ternary oxides (vanadates, molybdates, titanates, ferrites, lanthanates and cobaltites) -- their syntheses and electrical and magnetic properties. Has also done much work on the development of semiconductor electrodes for hydrogen production by solar photoelectrolysis of water and metal hydride systems for hydrogen storage.

Positions: Consultant Professor, Department of Energy, University of Madras; Chairman, Hydrogen Energy Task Force (DST), and Scientist-in-Charge, Hydrogen Energy Projects, Indian Institute of Technology (IIT), Madras (1977-80); Professor, Materials Science Research Centre (1974-77), Professor and Head, Department of Chemistry (1961-74), IIT, Madras.

Author/Editor Facet: Member, editorial board, *Int. J. Hydrogen Energy.*

Policy-making Bodies: Member, Board of Directors, International Association for Hydrogen Energy.

Address: Green Court (Apartment F.1), 18, Visweswarapuram Street, Mylapore, Madras 600 004; Tel: (044) 4991218.

SASTRI, Vavilala Vasudeva

Elected 1979

Born 24 August 1926; Machilipatnam, Andhra Pradesh
M.Sc. (1947), University of Mysore

Specialization: Petroleum Geology and Petroleum Exploration

Research Achievements: Sastri conducted and directed research (applied) for petroleum exploration in India and Asia for about 30 years. Propounded new concepts on Krishna-Godavari basin use, which came out true.

CSIR Emeritus Scientist, Jawaharlal Nehru University, New Delhi; Economic Affairs Officer, United Nations, ESCAP, Bangkok (1982-83); Advisor (Geology) to Malaysian National Oil Co. PETRONAS, Kuala Lumpur (1984-88); General Manager (Special Duties-Exploration), Oil & Natural Gas Commission (1982-84); Director, Research & Development, Institute of Petroleum Exploration, ONGC, Dehra Dun; Director, Institute of Petroleum Exploration, ONGC, Dehra Dun; Consultant to Standard Vacuum Oil Co., Calcutta.

Learned and Professional Societies: Member, American Association of Petroleum Geologists; Fellow, Geological Society of India and Palaeontological Society of India.

Awards and Honours: Gold Medal (Geological Society of India) (1973); Diploma of Honour for Excellence in Petroleum Exploration (University of Southern California, Los Angeles, USA) (1989); UGC National Lecturer (1982).

: Prince Mukharam Jha Lecture (Indian Geophysical Union).

Author/Editor Facet: Edited a book on Petroleum Exploration (ONGC); one of the editors of 'Tectonic Map of India', (UN and ONGC); coordinated 3 editions (1975,1985, 1989) of 'Oil and Natural Gas Map of Asia' (UN).

Policy-making Bodies: Member, International Stratigraphic Sub- Commission, USA.

Address: EA 1/18, Inderpuri, New Delhi-110 012; Tel: (011) 5752156.

SASTRY, Pidaparty Seshadri

Elected 1982

Born 23 August 1934; Vizianagaram, Andhra Pradesh
Ph.D. (1960), Indian Institute of Science (IISc), Bangalore

Specialization: Lipid Biochemistry, Neurochemistry

Research Achievements: Sastry has made fundamental contributions in the field of vitamin A; isolated major lipids of chloroplast membranes and identified them as glycosylglycerides; discovered the galactolipases; established lipid biosynthetic pathways in plants and for glycerophosphate and triglyceride synthesis in developing oilseeds; discovered an entirely new class of lipids in halophilic bacteria and made significant contributions to the biochemistry of myelination, synaptogenesis, signal transduction in neural tissues and on the effect of undernutrition on the developing brain.

Positions: Professor of Biochemistry, IISc, Bangalore; Senior Visiting Scientist, University of Wisconsin (USA) (1989-90); Visiting Professor, University of Minnesota (USA) (1982); Assistant Director, Neurochemistry Laboratory, Clarke Institute of Psychiatry, University of Toronto, Canada (1965- 68).

Learned and Professional Societies: Fellow, National Academy of Medical Sciences (India); Member, Society of Biological Chemists India (Secretary,1969-72; Vice-President, 1981-82), International Society for Neurochemistry, International Brain Research Organization, International Society for Developmental Neurobiology, Society for Neurosciences (India) and Guha Research Conference.

Awards and Honours:Giri Medal (1961); P.B. Rama Rao Award Society of Biological Chemists, India (1985); ASTRA Professor of Biochemistry, IISc (1992).

Author/Editor Facet: Volume editor, 'World Review of Nutrition and Dietetics'.

Policy-making Bodies: Member, Symposia Advisory Committee of International Union of Biochemistry (1969-74), Programme Advisory Committee on Neurobiology and Biomembranes for DST & DBT.

Address: Professor, Department of Biochemistry, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2306); Telex: 0845-8349 IISc IN; Fax: 91-80- 341683; E-mail: brain@biochem.iisc.ernet.in; Res: E-34 Staff Quarters, IISc, Bangalore 560 012 Tel: (080) 348075.

SATHYA MURTHY, Narayanasami

Elected 1993

Born 10 July 1951; Agarasethur, Pondicherry
Ph.D. (1975), Oklahoma State University, USA

Specialization: (Theoretical) Molecular Reaction Dynamics

Research Achievements: Sathyamurthy has studied the effect of reagent rotation on the rate of biomolecular exchange reactions. Worked on time-dependent quantum mechanical approach to reactive scattering and photodissociation; and chaos and fractals in atomic and molecular collisions.

Positions: Professor (1985-), Assistant Professor (1980-85), Indian Institute of Technology, Kanpur.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: Young Scientists Medal (INSA) (1980); Rev. Fr. L.M. Yeddanapalli Memorial Award (Indian Chemical Society) (1990).

Author/Editor Facet: Associated with the publication of a book: 'Reaction Dynamics: Recent Advances' (Springer, 1991).

Policy-making Bodies: Member, International Committee for the International Conference on Physics of Electronic and Atomic Collisions.

Address: Professor, Department of Chemistry, Indian Institute of Technology, Kanpur 208 016; Tel: (0512) 250572; Telex: 0325-296; Fax: 91-512-250007; E-mail: nsath@iitk.ernet.in; Res: 418, IIT, Kanpur 208 016; Tel: (0512) 250313.

SATHYANESAN, Appaji Gilbert

Elected 1982

Born 3 October 1926; Neyyoor,Tamil Nadu
Ph.D. (1958), D.Sc. (1974), Banaras Hindu University, Varanasi

Specialization: Neuroendocrinology, Comparative Endocrinology, Fisheries

Research Achievements: Sathyanesan has made important contributions to the hypothalamic control of the hypophysial function and, in turn, to the latter's influence on the peripheral endocrine glands in the teleosts. Established the pineal input into the hypothalamus and circumventricular organs and cerebrospinal fluid as the pathway neuroendocrine integration. His work has added to our understanding of the endocrine response to pollution, and has identified the link between the archaic polypterines and advanced teleosts.

Positions: Senior Scientist, Institute of Medical Sciences; Professor and Head, Department of Zoology, Banaras Hindu University, Varanasi; Emeritus Scientist, CSIR.

Awards and Honours: Hari Om Ashram Trust Award (1976); Rafi Ahmed Kidwai Memorial Prize (1984); S.L. Hora Memorial Award (Indian Society of Icthyologists)(1982).

Address: 7-93 B, Nesa Veedu, Muttom, P.O. 629 202, Dist. Kanniyakumari, Tamil Nadu.

SATYA SWAROOP

Elected 1956

Born 20 February 1913; Gurukul Kangri, Uttar Pradesh
Ph.D. (1947), Panjab University, Lahore

Specialization: Medical Science and Statistics

Research Achievements: Satya Swaroop's research encompassed three phases: supportive, health-oriented and promotional. Initially, he collaborated in studies on the endemicity and epidemicity of cholera in Bengal; applied the procedures developed by Alfred Lotka for forecasting the size and structure of India's population; and studied the effect of a decrease in infant mortality on the future population of India. Worked out the numerical significance limit of a test to evaluate the difference between proportions based on a pair of small samples and provided the

estimates of the number of organisms and their standard errors for observed configurations when routine 'dilution tests' were used to study the quality of water samples. Studied the death rates in specific age groups and developed further his previous concepts on indices of epidemicity. Also popularized the application of statistical methods in health work.

Positions: Assistant Professor of Vital Statistics and Epidemiology (1937-39) and Professor of Statistics (1949-50), All India Institute of Hygiene and Public Health, Calcutta; Statistician to Public Health Commissioner, Government of India (1939-43); Statistical Officer, Punjab Public Health Department(1943-47); Chief, Statistical Studies Section and Chief Statistician, Health Statistical Methodology, World Health Organization (1950-59); Visiting Lecturer in Biostatistics, Johns Hopkins University, USA (1958).

Learned and Professional Societies: Member, International Statistical Institute.

Author/editor Facet: Authored a standard reference book 'Introduction to Health Statistics' (E & S Livingstone, London, 1960).

Died 1 February 1962.

SATYAMURTHY, Nivarthi Suryanarayana *Elected 1981*

Born 5 February 1936; Bangalore, Karnataka
Ph.D. (1967), University of Bombay

Specialization: Nuclear Physics

Research Achievements: Satyamurthy used neutron scattering techniques extensively for studying magnetic materials. He and his colleagues discovered several new magnetic structures, including Yafet-Kittel angles in mixed nickel- zinc ferrites. Their pioneering work using polarized neutron diffraction led to studies on spin density distributions in solids. They identified large spin transfers in magnetite. Also discovered a new polarizer for thermal neutrons.

Positions: Associate Director & Head, Nuclear Physics Division, Bhabha Atomic Research Centre, Bombay.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Life Member, Magnetics Society of India (Vice- President), and Indian Physics Association (General- Secretary).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1980).

Other Contributions: As General Secretary of Indian Physics Association and Founder Member of Magnetics Society of India, Satyamurthy rendered yeoman service to the cause of physics bodies in the country. He was engaged in the setting up of the Centre of Advanced Technology at Indore.

Died 8 October 1984.

SAVUR, Srinivasa Rao

Elected 1941

Born 26 March 1894
Ph.D., University of London, UK

Specialization: Mathematics, Statistics, Geophysics

Research Achievements: A distinguished mathematician, Savur did much valuable work in statistics. His work on stress optical coefficients and stress-optical effect found mention in textbooks. He also did work on methods of determining simple correlation coefficients and periodicities, and theoretical development of a very general test, (the performance test) as well as a general test of significance applicable to all frequency distributions, which had important applications in meteorology.

Positions: Meteorologist, Indian Meteorological Service, Pune; Head, Geophysics Department, J.V.D. College of Science and Technology, Andhra University, Waltair.

Learned and Professional Societies: Fellow, Physical Society (London), Royal Meteorological Society (London), and Indian Academy of Sciences.

Died 4 May 1974.

SAWHNEY, Rai Bahadur Kalidas

Elected 1951

Born 4 June 1896
M.Sc. (1918), Panjab University, Lahore

Specialization: Agriculture, Bacteriology

Research Achievements: Sawhney did much work on the breeding and development of cotton varieties in India and neighbouring countries.

Positions: Professor of Biology, Islamia College, Peshawar; Hony Bacteriologist, Indian General Hospital, Peshawar;Cotton Breeder, Department of Agriculture, Baghdad, Iraq; Director of Agriculture (Research) and later Extension also, H.E.H. the Nizam's Government; Plant Breeder and Secretary, Indian Central Cotton Committee, Bombay.

Awards and Honours: *Rai Saheb* (1930); King George's Coronation Medal (1938); *Rai Bahadur* (1945).

Died (Date N.A.).

SAXENA, Kailash Narain

Elected 1973

Born 19 June 1927; Allahabad, Uttar Pradesh
Ph.D. (1951), University of Allahabad

Specialization: Insect Science: Behaviour, Insect Plant relationships, Integrated Pest Management

Research Achievements: Saxena has made advances in our knowledge of insect behaviour and insect-plant relationship, and developed biologically intensive pest management for tropics. The pest management components he has developed comprise plant resistance to pests, manipulation of cultural practices, particularly cropping patterns, application of biological control agents, and manipulation of pest behaviour.

Positions: Deputy Director (Research) (1993-), Programme Leader, Crop Pests Research (1983-93), International Centre of Insect Physiology and Ecology, Nairobi, Kenya; Visiting Professor, Max- Planck Institute for Biochemistry, Munich (1982-1983); Professor of Zoology (1969-82), Head, Department of Zoology (1976-79), University of Delhi.

Awards and Honours: Hooker Award (IARI) (1974-75); UGC National Lecturer (1975-76).

Lectureships: C.P. Alexander Memorial Lecture (University of Delhi) (1992).

Author/Editor Facet; Editor of INSA publications (1975-78); editor-in-chief, *Insect Sci. Applicn.* (1993-); member, editorial board, *Insect Behav.* (1987-).

Other Contributions: Saxena has striven for the cause of environment.

Address: Deputy Director, International Centre of Insect Physiology and Ecology, P.O. Box 30772, Nairobi, Kenya; Tel: 254- 2-802501/3/9, 803361 (Off), 601667 (Res); Fax: 254-2-803360.

SAXENA, Prem Narain

Elected 1987

Born 15 September 1925; Bareilly, Uttar Pradesh
D.Sc. (1978), Aligarh Muslim University

Specialization: Pharmacology

Research Achievements: Saxena co-discovered the tranquillizer and hypnotic activity in 2,3-disubstituted quinazolones. One of them is marketed as Methaquolone/Melsedin and enters the composition of Mandrax. Contributed to the ionic theory which holds that the constancy of body temperature in homoeotherms depends upon the balance of sodium and calcium ions in the hypothalamus - - an excess of sodium ions raising and that of calcium lowering the set-point. Pyrogens act by removing Calcium ions allowing sodium ions to produce fever. Studied the role of prostaglandins in fever production. Along with coworkers, Saxena devised an experimental method for studying antifilarial activity of drugs.

Positions: Chairman/Head, Pharmacology Department, J.N. Medical College; Director, Indigenous Drugs Research Unit; ICMR Emeritus Medical Scientist (1987-90); Professor Emeritus, Pharmacology Department, all at Aligarh Muslim University (1991-).

Learned and Professional Societies: Fellow, Indian Academy of Neurosciences (President, 1984), National Academy of Medical Sciences (India), and International Medical Sciences Academy.

Awards and Honours: Commonwealth Medical Fellow (1969-70); Wellcome Trust Medical Fellow (1970-71); B.N. Ghosh Memorial Lecture & Gold Medal (University of Calcutta) (1981).

Lectureships: B.N.Ghosh Memorial Oration (University of Calcutta) (1986).

Author/Editor Facet: Authored 3 books, co-authored 1 book; served as member, editorial board, *Indian J. Pharmacol.*

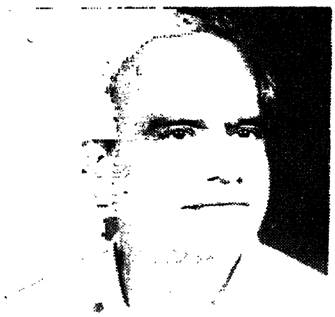
Policy-making Bodies: Member, International Brain Research Organization.

Other Contributions: Saxena established the Department of Pharmacology at J.N. Medical College, as its Founder Professor and Chairman.

Address: HIG - 30, ADA Colony, Ram Ghat Road, Aligarh 202002; Tel: (0571) 21778 (Res); (0571) 25684 (Off).

SAXENA, Rajendra Narain

Elected 1991



Born 7 January 1937; Kannauj, Uttar Pradesh
Ph.D. (1964), Banaras Hindu University, Varanasi

Specialization: Reproductive Physiology, Comparative Endocrinology and Neuroendocrinology

Research Achievements: Saxena and his group have established that the hypothalamohypophysial-gonadal activity is primarily regulated by an interaction of their hormones. Certain environmental factors, (e.g photoperiod) they have found, are the external cue which modifies the response of the endocrine gland to the endogenous hormones in some seasonally breeding animals, specially birds. He has also shown that neurotransmitters and sex steroids modulate the receptor- binding properties of neuropeptide cells of CNS and pituitary gonadotrophs.

Positions: Professor and Head, Department of Zoology, University of Delhi, Delhi.

Learned and Professional Societies: Fellow, American Ornithological Society, International Society for Neuroendocrinology (Paris), Society of Reproductive Biology and Comparative Endocrinology (India), and British Society of Reproduction and Fertility; Member, Executive Committee, Asia & Oceania Society for Comparative Endocrinology (Tokyo).

Awards and Honours: Hari Om Trust Award (1992).

Facet: Member, editorial boards of: *Asian J.Exp.Sci.* and *Pavo (Indian J. Ornithol.)*.

Address: Professor & Head, Department of Zoology, University of Delhi 110 007; Tel: (011) 7257524, 7257985, 7257212, ; Telex: 31- 78099 D.U. IN; Fax: 91-11-

6886427; Res: D3, 29/31, Chattra Marg, University of Delhi, Delhi 110 007; Tel: (011) 7257039, 7257156.

SEAL, Srish Chandra

Elected 1955

Born 4 July 1903; Shahazadpur, Bangladesh
D.Sc. (1980), University of Bombay

Specialization: Epidemiology and Immunology, Health and Socio- economic Surveys, Community Medicine

Research Achievements: Seal's greatest success is on plague, which has been eradicated in India. Another important contribution of his is on cholera by discovering cholera exotoxin. A vaccine prepared from this, cholera toxo-vaccine, could help eradicate this disease. He also did much work on epidemic dropsy, which has been conquerred. Seal also developed a 'Rural Health Service Scheme', in which all primary health centres have been brought under WHO's 'Health for all by 2000 A.D'.

Positions: Chairman, Indian Institute of Family Welfare and Health Education; Emeritus Medical Scientist , Indian Council of Medical Research (1970-73); Professor of Epidemiology, All India Institute of Hygiene and Public Health, Calcutta.

Learned and Professional Societies: Fellow, Asiatic Society, National Academy of Sciences (India), Indian Public Health Association, Indian National Institute of Ecology, American Public Health Association (Hony), American College of Physicians (Hony); President, West Bengal Voluntary Health Association, Rural Welfare Society (Diamond Harbour), and Indian Public Health Association; Foundation Fellow, International Medical Science Academy (Chairman, Calcutta Chapter).

Awards and Honours: Coates Medal (University of Calcutta) (1952); President, Medical and Veterinary Section, Indian Science Congress (1963); Leadership Recognition in Public Health (American Public Health Association) (1981); Dr. T.S. Tirumurti Memorial Lecture Award (INSA) (1987).

Lectureships: Dr B.N. Ghosh Memorial Lecture (University of Calcutta) (1971); B.C. Dasgupta Memorial Oration (1973).

Author/Editor Facet: Served as editor of *Indian J. Pub. Health* (1976-86).

Policy-making Bodies: Member, WHO Plague Research Committee (1981); Chairman, Population Education and Family Welfare Institute, Calcutta (1983).

Other Contributions: Member, Indian Forces After Care Fund Committee of Indian Red Cross Society (West Bengal Branch) (1982); President, Alumni Association of Medical Social Workers of West Bengal (1967,1968).

Address: Research Advisor, Calcutta Family Welfare Hospital Calcutta; Tel: (033) 274787; Res: 2 Fern Place, Calcutta, Tel: (033) 4405541.

SEKHON, Gurcharan Singh

Elected 1990

Born 5 November 1930; Basiharkh, Punjab
Ph.D. (1962), Iowa State University, USA

Specialization: Soil Fertility, Soil Chemistry, Agronomy

Research Achievements: Sekhon has done much work in relation to: soil potassium with a view to optimizing the use of fertilizer potassium; water solubility of phosphorus materials used in alkaline soils; nutrient indexing of soils to monitor fertility changes; and environmental pollution emanating from fertilizer use. Also, he has made recommendations with regard to fertilizers.

Positions: Director, Potash Research Institute of India (1977- 90); Professor of Soils, Punjab Agricultural University, Ludhiana (1969-82).

Learned and Professional Societies: Fellow, Indian Society of Soil Science (President, 1987-88), Indian Society of Agronomy (Vice-President and Executive Chairman, 1981-82), and National Academy of Sciences (India); Chairman, Commission VI, International Society of Soil Science (1990-94).

Awards and Honours: Potash Research Award (1976); Rafi Ahmed Kidwai Memorial Prize (1981); Fertilizer Association of India Award (1989); VASVIK Award (1990).

Lectureships: Manmath Nath De Memorial Lecture (Indian Society of Agricultural Chemistry, Allahabad) (1981); J.N. Mukherjee Memorial Lecture, (Indian Society of Soil Science) (1985).

Author/Editor Facet: Co-author of 'Potassium Research and Agricultural Production in India' and ' Potassium in Some Benchmark Soils of India'; served as chief editor of *J. Potassium Res.* (1983-90)

Policy-making Bodies: Chairman, Scientific Panel on Soils Agronomy (1980-93); Chairman Quinquenial Review Team of ICAR Projects on Agronomic Experiments (1979-82); Long term fertilizer experiments (1986).

Address: Department of Soils, Punjab Agricultural University, Ludhiana 141 004; Tel: (0161)-51960 (Ext 317); Telex: 386-473-COAE-IN; Fax: 91-161-51794; Res: 143 D. Kitchlew Nagar, Civil Lines, Ludhiana 141 001.

SEN, Amiya Bhushan

Elected 1981

Born 31 May 1926
D.Phil. (1962), University of Calcutta

Specialization: Clinical & Experimental Parasitology

Research Achievements: Sen has made important contributions to parasitic chemotheraphy and immunology. His work on host- parasite relationship especially immuno-pathology and pharmacological mediators in filariasis, malaria, leishmaniasis, hookworm and cestode infections, has received wide peer recognition

Positions: CSIR, Emeritus Scientist, Deputy Director and Head, Division of Parasitology, Central Drug Research Institute, Lucknow; Director, Rajendra Memorial Research Institute of Medical Sciences, Patna.

Learned and Professional Societies: Member, Indian Society for Parasitology, Microbiology Association of India, and International Filariasis Association; Fellow, Indian Society of Communicable Diseases.

Address: CSIR Emeritus Scientist, Central Drug Research Institute, Chattar Manzil, Lucknow 226 001; Tel: (0522) 232410, 232411-18 (Ext 4256); Res: 148, Rabindra Palli (Off. Faizabad Road), Lucknow 226 016: Tel: (0522) 383436.

SEN, Bhupati Mohan

Foundation Fellow

Born 1 March 1888; Rajshahi, Bangladesh
M.A. (1912), University of Cambridge, UK

Specialization: Mathematics, Physics

Research Achievements: Sen made notable contributions to differential geometry, hydrodynamics and modern physics. He pointed out the distinction between the applicability and deformation of a surface and its bearing on the general theory of deformation. Showed that the partial differential equation of the Monge-Ampere type, on which the deformation of a surface is supposed to depend, is a necessary but not a sufficient condition. In 1947 he published a booklet in which he advanced a new theory of light and matter, claiming that the theory to be logically sound and in accordance with experimental evidence.

Positions: Principal, Presidency College, Calcutta; Professor of Mathematics, University College of Science, Calcutta.

Learned and Professional Societies: President, Indian Physical Society (1934-35).

Awards and Honours: President, Mathematics and Statistics Section, Indian Science Congress (1944); Padma Vibhushan.

Died 24 September 1978.

SEN, Bibhutibhusan

Elected 1952

Born 1 March 1898; Nayapara, Bangladesh
D.Sc., University of Calcutta

Specialization: Applied Mathematics

Research Achievements: Sen specialized in elasticity. Worked on elastodynamics, thermoelasticity, viscoelasticity, piezo- electricity, magnetoelasticity, plasticity, theoretical seismology, and fluid mechanics.

Positions: Lecturer in Mathematics, Education Service, Government of Bengal;Research Professor, Birla College of Engineering, Pilani; Professor and Head, Jadavpur University; Professor and Head, Department of Mathematics and Principal, Vidya Bhavan, Visva Bharati; Emeritus Professor, Jadavpur University, Calcutta.

Awards and Honours: President, Mathematics Section, Indian Science Congress (1952).

Author/Editor Facet: Sen authored two books: 'Special Functions' and 'Laplace Transform'; another titled 'Numerical Analysis' was published posthumously.

Died 13 December 1976.

SEN, Hemendra Kumar

Foundation Fellow

Born 1888; Baldhara, Bangladesh
D.Sc. (1915), University of London, UK

Specialization: Chemistry

Research Achievements: Sen started his research career with a study of some problems in inorganic and analytical chemistry. He developed a method for the estimation of nitrites. Also developed methods for the preparation of a number of reduced pyridine, quinoline and isoquinoline derivatives by the condensation of oxymethylene ketones and ß-diketones with cyanacetamide. Reported the preparation of some aldol compounds by the condensation of chloral with acetone, acetophenone, acetoveratrone, acetotoluene and acetonaphthone. In later years, his interest shifted to biochemistry, specially fermentation chemistry, and chemical technology. New uses for shellac and improved methods of its manufacture owe to Sen's researches.

Positions: Chemist, Tata Iron and Steel Works, Jamshedpur (1916); Chief Chemist, Sulphuric Acid Works of Jamal Brothers in Burma (1916-19); Professor in Applied Chemistry, University of Calcutta (1926-35); Director, Central Lac Research Institute (1935-44); Director of Industries, Bihar.

Learned and Professional Societies: President, Indian Institute of Chemistry (1930-32; 1935-36) and Indian Chemical Society (1940-41).

Awards and Honours: President, Chemistry Section, Indian Science Congress (1927).

Lectureships: Sukhraj Rai Lectureship (Patna University) (1927); Adhar Chandra Memorial Lecture (University of Calcutta) (1931).

Policy-making Bodies: Served on many research committees of CSIR, in particular on Fuel Research Committee.

Died 6 June 1945.

SEN, Himansu Gopal

Elected 1980

Born 1 February 1927; Calcutta, West Bengal
Ph.D. (1960), University of Nebraska, Lincoln, USA

Specialization: Parasitology

Research Achievements: Sen did a significant piece of research at Hindustan CIBA-GEIGY Research Centre by adapting the human hookworm *Necator americanus* to the golden hamster, *Mesocricetus auratus*, an abnormal host. This new host- parasite system serves as an excellent tool for studying experimental human hookworm infection in the laboratory since a relatively high percentage of infective larvae reach sexual maturity and establish as a stable population in the hamsters. Sen's finding opens up various lines of investigation, e.g. biochemistry of adult parasites and their immunogenic behaviour to hamster in the laboratory.

Positions: Head, Division of Parasitology, Hindustan CIBA- GEIGY Research Centre, Bombay; Technical Advisor, R & D Organon (India) Ltd, Calcutta; Chief of R & D, Dey's Medical Laboratories, Calcutta.

Learned and Professional Societies: Fellow, Royal Society of Tropical Medicine & Hygiene (London); Member, American Association for the Advancement of Science.

Author/Editor Facet: Member, editorial board of *J. Parasitol.*

Address: FE 477, Sector 3, Salt Lake, Calcutta 700 091; Tel: (033) 372744.

SEN, Jitendra Mohan

Elected 1935

Born 25 April 1892; Calcutta, West Bengal
M.Ed. (1922), University of Leeds, UK

Specialization: Education

Research Achievements: Sen studied methods of education and organized postgraduate studies in education.

Positions: Head Master, Keshab Academy; Principal, Krishnagar College, Nadia, and David Hare Training College, Calcutta; Assistant Director, Public Instruction, West Bengal; In- charge, Teacher's Training College, University of Calcutta.

Learned and Professional Societies: Member, World Association for Adult Education (1931-32); President, Indian Psychological Association (1942-45); Hony General Secretary, Asiatic Society (1950-54); Hony Secretary, Keshab Academy, Calcutta (1949-56); Life Member, Visva Bharati; Council Member, INSA.

Lectureships: Khaitan Lectures (University of Calcutta) (1955).

Awards and Honours: President, Psychology Section, Indian Science Congress (1936).

Author/editor Facet: Sen authored a number of books both in English and Bengali on education, one of them being 'Manaswiter Map' (Measurement of Intelligence);served as editor of *Indian J. Psychol.* (1948-53) and INSA publications.

Died 29 August 1956.

SEN, Kshitish Chandra

Elected 1949

Born 5 September 1899; Khulna, Bangladesh
D.Sc. (1925), University of Allahabad

Specialization: Biochemistry, Animal Nutrition

Research Achievements: Sen initially did some work in colloid chemistry. He gave a new interpretation of Shulze-Hardy law. Developed a general theory of ion antagonism. Turning his attention to nutritional problems at Izatnagar, Sen found that the negative balance in calcium in cattle due to their being fed rice straw owed to the alkaloids produced through ingestion of large quantities of oxalates in the roughage. Water-washing and treatment with dilute alkali, he found, removed most of the oxalates. This became an accepted procedure for improving the nutritive value of straws in general and paddy straw in particular. Sen and coworkers found that the degeneration of draught cattle in certain parts of India was due to fluorine intoxication. They also found that the productive life of animals could be prolonged by many years if aluminium sulphate is fed as a supplement. Studying the effect of feeding iodinated casein on the yield and composition of milk as well as on the growth of calves, his students brought to light the zero practical value of supplementary feeding.

Positions: Biochemist, Imperial Veterinary Research Institute, Mukteswar, Kumaon (1929-31); Head, Division of Animal Nutrition Research, Imperial Veterinary Research Institute, Mukteswar (1936-43); First Director, National Dairy Research Institute, Karnal (1944-57).

Learned and Professional Societies: Fellow, National Academy of Sciences (India);Member, Indian Standards Institution; Member, INSA Council (1967-69).

Author/Editor Facet: Authored 'Animal Nutrition Research in India' (Macmillan, 1953); editor, *Indian J. Dairy Sci.* and *Indian Dairyman.*

Died 27 February 1977.

SEN, Nikhil Ranjan

Foundation Fellow

Born 23 May 1894, Dhaka, Bangladesh
D.Sc. (1921), University of Calcutta

Specialization: Applied Mathematics

Research Achievements: Under Sen's guidance, Calcutta became an active centre for fundamental research in various disciplines of applied mathematics: relativity, astrophysics, geophysics, quantum mechanics, statistical mechanics, hydromagnetics, fluid dynamics, elasticity and ballistics. Sen pioneered work on the internal constitution of stars and, in collaboration with his students, he constructed stellar models based on the laws of thermonuclear-energy generation. In fluid dynamics, he led a team of workers investigating problems on the boundary layer, wave resistance, isotropic turbulence and shock waves. His study of Heisenberg's equation for the decay of isotropic turbulence deserves special mention.

Positions: Rashbehary Ghose Professor of Applied Mathematics (1924-59) and Dean, Faculty of Science, University of Calcutta; Hony Professor, Indian Association for the Cultivation of Science,Calcutta.

Learned and Professional Societies: Life Member, Calcutta Mathematical Society and Indian Association for the Cultivation of Science; Member, Council (1935-41, 1949-51) and Vice-President (1959-60), INSA.

Awards and Honours: President, Mathematics Section, Indian Science Congress (1936).

Other Contributions: Father of applied mathematics in India. Sen was one of the early popularizers of science in vernacular. He stood by his friend S.N. Bose, who took up the task of establishing *Bangiya Vijnan Parishad* in Calcutta.

Died 13 January 1963.

SEN, Nirmal Kumar

Elected 1951

Born 1 January 1897

D.Sc., University of Dacca, Bangladesh

Specialization: Chemistry

Research Achievements: Sen did some work on chemical investigation of jute seeds.

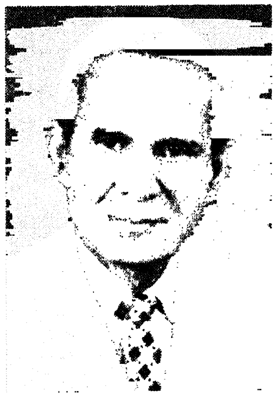
Positions: Professor and Head, Department of Chemistry, Presidency College, Calcutta; Founder Director, State Forensic Science Laboratory, West Bengal.

Died 1984.

SEN, Prafulla Kumar

Elected 1962

Born 31 December 1904; Jessore, Bangladesh
M.D. (1933), University of Berlin, Germany; T.D.D. (1934), Ph.D. (1935), University of Wales, UK



Specialization: Chest Diseases, Medical Science

Research Achievements: Sen has done extensive research on tuberculosis and chest diseases. His work at the University of Berlin on nutrition in relation to tuberculosis showed that extra and special diet is unnecessary. The validity of this conclusion was proved through chemotherapeutic work. Sen's other significant contributions relate to tuberculosis and silicosis in coal miners, mapping of tuberculosis in

West Bengal, domiciliary treatment of pulmonary tuberculosis, planning anti-TB chemotherapy on the basis of biological values of drugs, and the effect of anti-TB drugs on pregnancy.

Positions: In-charge of Research (1990-), Director, B.C. Roy Research Institute, Calcutta (1952-90); Professor of Medicine, Medical College, Calcutta (1952-66); Head, Chest Department, University College of Medicine, Calcutta (1952- 66).

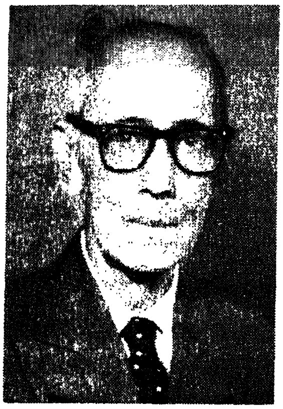
Learned and Professional Societies: Fellow, National Academy of Medical Sciences (India), Association of Chest Physicians, International Academy of Medical Sciences (India), and American College of Chest Physicians.

Policy-making Bodies: Served as Chairman, International Union Against Tuberculosis (Committee on Treatment); Vice- President, International Forlanini Association (Rome). Also served as a planner and executor of almost all national studies on baciliary resistance in the populations etc. under ICMR and Tub. Assoc. of India.

Address: 99/5/4, Ballygunge Place, Calcutta 700 019; Tel: (033) 4757512.

SEN, Rabindra Nath

Elected 1954



Born 7 January 1896; Dhakha, Bangladesh
Ph.D. (1930), University of Edinburgh, UK

Specialization: Pure Mathematics

Research Achievements: A distinguished mathematician, Sen worked on differential geometry, teleparallelism, Senian geometry, Riemannian geometry and many others. His investigations on the behaviour of an arbitrary parallel displacement in a metric space led to the discovery (1945- 50) of an algebraic system of affine conections in which Levi-Civita parallelism could be identified. He applied this algebraic system to Finsler space and this work is considered to be an important contribution to Finsler geometry.

Positions: Hardinge Professor and Head, Department of Pure Mathematics, University of Calcutta.

Learned and Professional Societies: President, Calcutta Mathematical Society (1963-66).

Awards and Honours: President, Mathematics Section, Indian Science Congress (1956).

Author/Editor Facet: Sen wrote two textbooks : 'A Course of Geometry' and 'Foundations of Geometry'.

Died 19 July 1974.

SEN, Saurindranath

Elected 1986

Born 28 February 1921; Jamshedpur, Bihar
D.Sc. (1951), University of Calcutta

Specialization: Precambrian Geology, Structure Tectonics and Metamorphism

Research Achievements: Sen is a pioneer researcher in India in three branches of geology. He interpreted Gondwana depositional environment on the basis of mechanical analysis of sediments. Used magmatectonics to trace the evolution and emplacement of a granite body (in east Singhbhum). Brought petrofabrics to bear on the question of structural evolution of high-grade metamorphic rocks (in east Singhbhum). From petrographic and petrofabric studies, he suggested with respect to labradorite feldspar some deformation mechanisms, identifying crystallographic orientation of possible translation planes from then known structure of labrodorite which were subsequently confirmed by experimental work overseas. Suggested a polyphyletic origin of charnockites; showed that calc-magnesian sediments and basic igneous rocks undergoing high-grade metamorphism and migmatization converge towards charnockite. Carried out extensive studies in the Aravalli Mountain chain. These studies have led him to utilize the plate tectonic hypothesis in order to explain the tectonic evolution of the Precambrian rocks of central Rajasthan. The work brought forth a basic conceptual contribution in geotectonic reconstruction of fold belts; that highlighted the inadequacy of the 'geosyncline concept' in explaining the structural and tectonic independence of the constituent zones of a single fold belt within the Composite Aravalli Range'. From geomorphological work he has also traced the neotectonic evolution of the Aravalli Mountain chain.

Positions: Professor (Retired), Geology Department, University of Calcutta; Visiting Lecturer, Columbia University, USA (1954-56).

Awards and Honours: UGC National Fellow (1979-80); D.N. Wadia Medal (INSA) (1989).

Other Contributions: Sen introduced Structural Geology including Petrofabrics and Magmatectonics in the Post- graduate, Department of Geology, University of Calcutta and Petrofabrics in the Department of Geology, Columbia University.

Address: 166/30 Lake Gardens, Calcutta 700 045; Tel: (033) 753012.

SEN, Sisir Kumar

Elected 1979

Born 25 June 1929; Madaripur,Bangladesh
Ph.D. (1957), University of Chicago, USA

Specialization: Metamorphic Petrology and Geochemistry

Research Achievements: Sen has formulated and refined several widely used mineral geobarometers and geothermometers; established a primary status for hornblendes in basic granulites; explained the behaviour of fluids in granulite metamorphism; correlated the appearance of garnets in basic granulites with isobaric cooling; and demonstrated the significance of potassium in natural plagioclases.

Positions: Professor of Geology, Dean, Indian Institute of Technology, Kharagpur.

Learned and Professional Societies: Foundation Fellow, West Bengal Academy of Science and Technology; Fellow, National Academy of Sciences (India), Geological Society of India, and Geological, Mining and Metallurgical Society of India; Member, Sigma Xi.

Awards and Honours: Silver Jubilee Research Award (IIT, Kharagpur) (1985); UGC National Lecturer (1986-87).

Lectureships: P.N. Datta Memorial Lecture (1982); S. Ray Memorial Lecture (1982).

Author/Editor Facet: Member, editorial board (current), *J. Metamor. Geol.*; earlier on the editorial boards of: *Proc. Indian Acad. Sci., Earth Planet. Sci., Indian Minerals*, and many other journals in earth sciences; also edited a book 'Elementary Thermodynamics for Earth Scientists'.

Policy-making Bodies: Member, IUGS Subcommission on Systematics of Metamorphic Rocks (1985-) and IUGS Working Group on Charnockites (1972-75).

Address: CSIR Emeritus Scientist, Department of Geological Sciences, Jadavpur University, Calcutta 700 032; Tel: (033) 724044; Telex: 21 4160 VC JU IN; Res: Flat No. 10/5, Block C, Green Tower, Golf Green, Calcutta 700 045; Tel: (033) 4737564.

SEN, Soumitra Kumar

Elected 1989

Born 24 October 1936; Kent, UK
D.Sc. (1971), University of Calcutta

Specialization: Genetics & Plant Molecular Biology

Research Achievements: Sen has studied chromosome organization during crossover. His work has shed light on our understanding of structural and functional organization of eukaryotic chromosomes. He has studied the role of synaptonemal complexes. Analyzed the nuclear DNA content and the nucleotide sequence complexity in certain plants including rice. Structural organization of an eukaryotic gene in *Drosophila* has been functionally colineared as a case for analogy with the prokaryotic organization. He and his coworkers are carrying out genetic engineering of plant systems in jute, rice and oil- yielding *Brassica* sp. Androgenic plant production on a very large scale in *indica* rice and *Brassica* sp. for the first time yielded genotypes of agricultural importance. Cellular manipulation techniques for production of genetic recombinants in these crops has yielded results of importance. *Agrobacterium* plasmids as vectors for genetic engineering have been used for genetic engineering of crops plants. T-DNA specific genes for IAA and zeatin synthesis are being manipulated through recombinant DNA techniques for generating crop plants with altered growth chracteristics.

Positions: Professor, Plant Molecular and Cellular Genetics, Bose Institute, Calcutta; Visiting Professor, Max-Planck Society, Germany.

Address: Professor, Bose Institute, PI/12 CIT Scheme VII-M, Calcutta 700 054; Tel: (033) 379219, 379416, 379544; Res: 71/3, Palm Avenue, Calcutta 700 019; Tel: (033) 475071.

SEN, Syamapada

Elected 1983

Born 6 April 1927; Calcutta, West Bengal
D.Phil. (1954), Ph.D., University of Calcutta

Specialization: Plant Physiology, Microbiology

Research Achievements: Sen has demonstrated that: Amon varieties of rice can be made to flower twice a year; membrane-bound steroids are involved in auxin-induced growth and in flowering; tetracyclic triterpenoids have antigibberellin properties; inhibitors of photosynthesis occur in non-leaf green organs; substances produced in flowers limit nitrogenase activity of root nodules and photosynthesis in leaves; foliar application of nitrogen- fixing microorganisms improves crop yield; RNA synthesis is involved in auxin induction of growth; antibiotic substances occur in bryophytes and pteridophytes; inter-generic transformation between *Rhizobium* and *Azotobacter*, as also genetic transformation of antibiotic-producing bacteria, is possible.

Positions: INSA Senior Scientist (1992-); Head, Department of Botany (1961-80); Professor of Botany (1968-92); Dean, Faculty of Science, University of Kalyani (1970; 1985-87).

Learned and Professional Societies: Fellow, West Bengal Academy of Science and Technology; Vice-President, Society for Plant Physiology and Biochemistry.

Awards and Honours: J.J. Chinoy Memorial Medal (Indian Society for Plant Physiology) (1976); President (Botany Section) Indian Science Congress (1985); Silver Plaque at First International Congress of Plant Physiology (1988); B.B. Sarkar Oration Medal (Physiology Society of India) (1992).

Lectureships: P.N. Das Memorial Lecture (1979); S.M. Sircar Memorial Lecture (Bose Institute, Calcutta) (1980); P. Parija Memorial Lectures (1984, 1988); Umakant Sinha Memorial Lecture (All India Congress of Cytology & Genetics, Kalyani) (1990); J.C. Bose Lecture (University of Calcutta) (1990).

Author/Editor Facet: Editor-in -Chief, *Plant Biochem. J.* (1974-82); *Plant Physiol. Biochem.* (1983-89) and *Bull. Bot. Soc. Bengal* (1966-68); served on editorial boards of many journals; edited/co-edited four books: 'Nitrogen Assimilation and Crop Productivity' (1978); 'Recent Developments in Plant Sciences' (1982); 'Biofertilizers' (1988); 'Plant Physiological Research in India' (1988).

Policy-making Bodies: Member, International Committee of Indian Society for Plant Physiology to review the state of plant physiology in India.

Other Contributions: Sen has contributed substantially to the improvement of teaching botany with an interdisciplinary bias at high school to university levels; and to popularization of science in Bengali and English; also associated with National Science Talent Search Programmes.

Address: P-10/251, Kalyani 741 235, Nadia, West Bengal.

SENGUPTA, Jyotish Chandra *Elected 1962*

Born 15 December 1900, Outshahi, Bangladesh
Dr.Phil. Nat. (1928), *University of Heidelberg, Germany*

Specialization: Botany (Classical)

Research Achievements: Sen Gupta's researches related to osmotic values and water absorption of common plants around Calcutta and Darjeeling, and also of mangrove vegetation in the Sunderbans. In collaboration with his students, he studied the effect of day length and temperature on the flowering of jute and *Sesamum* plants. Demonstrated the relationship between leaf shape of *Sesamum* with photoperiod. Also studied the effects of nutrient deficiency on the growth and fibre content of jute.

Positions: Professor of Botany (1929), Senior Professor and Head, Botany Department (1939) and Principal (1950), Presidency College, Calcutta; Chief Botanist, Botanical Survey of India (1955); Administrator, Board of Secondary Education (1963); CSIR Professor Emeritus.

Learned and Professional Societies: President, Botanical Society of Bengal and Indian Society of Plant Physiology; Secretary, Indian Society of Soil Science; Council Member, Asiatic Society; Member, INSA Council (1964-65).

Awards and Honours: Paul Bruhl Memorial Medal (Asiatic Society); President, Botany Section, Indian Science Congress (Once).

Other Contributions: Played a role in the setting up of Birla Industrial & Technological Museum, Calcutta.

Died 21 January 1969.

SENGUPTA, Monoranjan

Elected 1954

Born 11 July 1904; Rangpur, Bangladesh
B.Sc. Engng (Hons), C.P.E., University of Glasgow, UK

Specialization: Electrical Engineering

Research Achievements: Sen Gupta studied the change of resistance of semiconductors in a magnetic field. He also investigatged the phenomenon of high-pressure gland leakage in relation to steam turbine efficiency. Worked on continuously evacuated-type cathode-ray oscillograph and surge generator at the High Voltage Research Laboratory of Metropolitan Vickers Ltd., Manchester.

Positions: Principal, Professor & Head, Department of Electrical Engineering, Engineering College, Banaras Hindu University, Varanasi (1944-68); Professor and Head, Department of Electrical Engineering, Bengal Engineering College, Sibpur (1933-44).

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Institution of Electrical Engineers (London), Institution of Mechanical Engineers (London), Institution of Electronic and Radio Engineers (London) and Institution of Engineers (India); Member, Board of Studies in Engineering and Metallurgy Section, All India Council of Technical Education.

Awards and Honours: President, Engineering and Metallurgy Section, Indian Science Congress (1947).

Address: B 21/108, Binayak (Kamachha), Varanasi 221 010; Tel: (0542) 310723.

SENGUPTA, Narendra Nath

Foundation Fellow

Born 23 December 1889; Tentulia, Bangladesh
Ph.D. (1915); Harvard University, USA; D.Sc., University of Calcutta

Specialization: Psychology

Research Achievements: Sen Gupta was a highly reputed and pioneer psychologist. A man of great wisdom, intuition and creative ability, he analyzed the mind and its various facets. His contributions to psychological knowledge covered the social, ethnic, experimental, educational, criminal and religious aspects. He also made notable contributions to the disciplines of philosophy, education and anthropology.

Positions: Professor of Philosophy and Psychology, University of Calcutta; Professor of Philosophy and Psychology, University of Lucknow.

Learned and Professional Societies: Founder Member, Indian Psychological Association.

Awards and Honours: President, Psychology Section, Indian Science Congress (1925), and Indian Philosophical Congress (once).

Author/editor Facet: His major works were 'Introduction to Social Psychology', 'Heredity in Mental Traits', 'Mental Growth and Decay' and 'Mechanisms of Ecstasy' (unpublished); founder editor, *Indian J. Psychol.*

Other Contributions: Established the Department of Psychology at University of Calcutta, the first university department in India.

Died 13 June 1944.

SENGUPTA, Pasupati

Elected 1979

Born 14 November 1924; Calcutta, West Bengal
Ph.D. (1952), University of Calcutta

Specialization: Organic Chemistry

Research Achievements: Sengupta's contributions relate to the chemistry of natural products, mechanism of organic reactions, transformations of triterpenoids, use of new reagents, and conformation and stereochemistry of complex organic molecules.

Positions: Professor and Head, Department of Chemistry and Dean, Faculty of Science, University of Kalyani, Kalyani.

Learned and Professional Societies: Fellow, Indian Chemical Society; Member, Indian Association for the Cultivation of Science.

Address: B-10/249, Kalyani 741 235, West Bengal; Tel: (03162) 98929.

SENGUPTA, Supriya Mohan

Elected 1982

Born 28 June 1932; Calcutta, West Bengal
D.Sc. (1967), University of Calcutta

Specialization: Sedimentary Geology & Physical Stratigraphy

Research Achievements: Sengupta's contributions are in the fields of: stratigraphy and sedimentation in the Gondwana, Vindhyan and Bengal basins; experimental-theoretical investigations of the mechanism of sediment transportation and deposition by suspension currents; development (in collaboration with mathematicians and statisticians) of models for sedimentation, and new techniques for analysis of granulometric and palaeocurrent data.

Positions: INSA Senior Scientist (1993-); Professor of Geology (1981-92), Head, Department of Geology & Geophysics (1982-92), Indian Institute of Technology, Kharagpur; Member, Geology Faculty, Indian Statistical Institute, Calcutta (1962-81) (Professor of Geology, 1972); Guest Scientist, University of Uppsala, Sweden (1971-72,1975); Geophysicist, Standard-Vacuum Oil Co. (1955-61).

Learned and Professional Societies: Member, International Association of Sedimentologists (Council 1971-78), International Association for Mathematical Geologists (Council, 1969-71); Life Fellow, Geological, Mining & Metallurgical Society of India.

Author/Editor Facet: Co-editor, *Indian J. Geol.* (1984-89).

Policy-making Bodies: Served as member of the Scientific Advisory Committee (Geoscience), Union Ministry of Petroleum, (1986-91).

Address: Department of Naval Architecture (Marine Sedimentation Laboratory), Indian Institute of Technology, Kharagpur 721 302; Tel: (03222) 2221 to 2224 (Ext 5464); Telex: 06401-201 ITKG IN; Fax: 91-3222-2303.

SESHACHAR, Bagepalli Ramachandrachar *Elected 1953*

Born 9 January 1908; Bagepalli, Karnataka
D.Sc. (1940), University of Madras

Specialization: Cell Biology, Protozoology

Research Achievements: Seshachar's researches relate to two distinct areas: (i) the cytology of Gymnophiona (Apoda), Amphibia. chromosomes, gametogenesis and development. Apoda, a group of rare amphibians, restricted in distribution. Only work of the kind so far; and (ii) the cytology, cytochemistry, ultra- structure and DNA synthesis in certain Ciliate Protozoa. These studies are pioneering efforts at understanding the unique nuclear structure of ciliates.

Hony Associate, Centre for Theoretical Studies, Indian Institute of Science, Bangalore (1973-); Professor and Head, Department of Zoology, University of Delhi (1960- 71); Professor & Head, Department of Zoology, University of Mysore (Central College, Bangalore) (1926-60); Harrison Research Fellow, University of Pennsylvania; Faculty Positions at Columbia University, New York; Rockefeller University, New York; King's College, London.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Foundation Fellow, International Society for Protozoology; Secretary (1961-64), Foreign Secretary (1965- 66) and President, INSA (1971-72).

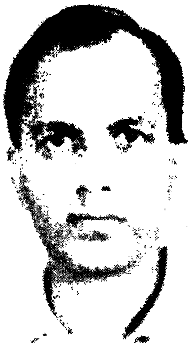
Awards and Honours: Sunder Lal Hora Medal (INSA) (1965).

Author/Editor Facets: Editor of publications, INSA (1967-70).

Address: 50, 10th Main Road, Malleswaram, Bangalore 560 055; Tel: (080) 341469.

SESHADRI, Conjeevaram Srirangachari

Elected 1973



Born 29 February 1932; Conjeevaram, Tamil Nadu
Ph.D. (1958), University of Bombay

Specialization: Algebraic Geometry, Algebraic Groups

Research Achievements: Seshadri has contributed to the following fields: (i) moduli of vector bundles: (a) solution of Serre's problem on the affine plane, (b) construction of the Picard variety on any complete variety, (c) construction of the moduli spaces of vector bundles on a smooth projective curve of genus $g \geq 2$; further (in collaboration with M.S. Narasimhan) their transcendental characterization by unitary representations of certain Fuchsian groups, (d) parabolic vector bundles on curves, (e) vector bundles on singular curves; (ii) proof of Mumford's conjecture, especially its proof for GL(2); and (iii) (in collaboration with Lakshmibai and Musili) standard monomial theory generalizing a classical work of Hodge.

Positions: Dean, School of Mathematics, SPIC Science Foundation, Madras; Senior Professor, Institute of Mathematical Sciences, Madras (1984-89); Professor (1965), Senior Professor (1975-84), Tata Institute of Fundamental Research, Bombay.

Learned and Professional Societies: Fellow, The Royal Society, London, Indian Academy of Sciences, Maharashtra Academy of Sciences, Royal Society of London, and Third World Academy of Sciences; Member, American Mathematical Society; Member, INSA Council (1987-89).

Awards and Honours: Shanti Swarup Bhatnagar Prize(1972); Srinivasa Ramanujan Medal (INSA) (1985).

Author/Editor Facet: Member, editorial board, *Proc. Indian Acad. Sci. (Math. Sci.)*; advisory editor, 'Texts and Readings in Mathematics'.

Policy-making Bodies: Member, International Mathematical Union (till 1990), National Board for Higher Mathematics.

Address: Dean, School of Mathematics, SPIC Science Foundation, East Coast Chambers, 92, G.N. Chetty Road, T.Nagar, Madras 600 017; Tel: (044) 8284232, 8284251; Telex: 041-7108 SPIC IN; Fax: 91-44-8256842; E-mail: css@ssf.ernet.in; Res: No. 7, 6th Cross Road, Besant Nagar, Madras 600 090; Tel: (044) 4914534.

SESHADRI, Tiruvenkata Rajendra

Elected 1942

Born 3 February 1900; Kulitalai, Tamil Nadu
Ph.D. (1930), University of Manchester, UK; Ph.D. *(h.c.)* from Andhra, Banaras, Delhi and Osmania universities

Specialization: Natural Products Chemistry

Research Achievements: Seshadri's chief contributions were in oxygen heterocyclics, which began with the isolation and structure elucidation of the flavonoid pigments of Indian plants both aglucones and glucosides. He developed methods of methylation to facilitate the degradative study of the aglucones to get an insight into the structure of glucosides. The studies Seshadri and his school have covered essentially methylation of anthoxanthins and glycosides, oxidative and selective demethylation; nuclear oxidation, reduction, hydrogenation and dehydrogenation; anthocyanins, leucoanthocyanidins and quinonoid, anhydro bases; nuclear methylation, allylation and prenylation; Wesley-Moser rearrangement, Algar-Flynn-Oyamada reaction and reactions of chalcone epoxides; synthesis of furanochromones, chromenochromones and chromeno-flavones, flavonones, and isoflavonones of some interesting plants, viz. *Pongamia glabra, Psoralea corylifolia,* and *Gossypium* sp.: neoflavonoids, cyanomaclurin; biflavonyls, pterocarpans, santalin pigments, bicoumarinyl, flavonolignans, C- glycosides; and chemistry of lichen substances, terpenoids, and theories of biogenesis.

Positions: Professor of Chemistry, Andhra University, Waltair (1937-49); Head and Emeritus Professor, Department of Chemistry, and Centre for Adavanced Study for the Chemistry of Natural Products (1949-75), University of Delhi, Delhi.

Learned and Professional Societies: Fellow, Royal Society of London and Indian Academy of Sciences (President); Member, Indian Chemical Society (President), Indian Pharmaceutical Association (President), Oil Technology Association (President), Royal Institute of Chemistry (London) (Chairman, North India Section), and Indian Pharmaceutical Congress (President); President, INSA (1967-68).

Awards and Honours: Cooch-Behar Professorship of Indian Association for the Cultivation of Science (IACS), Calcutta; Hony Professorships of Andhra and Osmania Universities; Acharya Prafulla Chandra Ray Medal and Acharya Gnanendra Ghosh Medal (Indian Chemical Society); Shanti Swarup Bhatnagar Medal and Meghnad Saha Medal (INSA); President, Indian Science Congress (1966-67), Padma Bhushan (1963).

Lectureships: H.K. Sen Lecture (Institution of Chemists, India); B.C. Guha Lectures (ISCA); B.M. Singh Lecture (Panjab University); K. Venkataraman Lecture (University of Bombay).

Author/Editor Facet: Served on the editorial board of: *Indian J. Chem.*

Policy-making Bodies: Headed the governing bodies of CSIR, ICMR, etc.

INSA has instituted 'Professor Tiruvenkata Rajendra Seshadri Seventieth Birthday Commemoration Medal'.

Died 27 September 1975.

SESHAIYA, Rebala Venkata

Elected 1961

Born 8 February 1898; Nellore, Andhra Pradesh
B.Sc. (1919), University of Madras

Specialization: Zoology/Marine Biology

Research Achievements:Seshaiya's researches, spread over four decades, covered zoology and marine biology. His works on the embryology of molluscs are classic in invertebrate embryology. He also made noteworthy contributions to the study of gastropods, new beginnings in embryology, modern trends in marine biology and development and composition of teleost scales. He left a deep imprint on Indian zoology.

Positions: Professor of Zoology and Head, Department of Marine Biology, Advanced Study in Zoology and Marine Biology, Annamalai University.

Learned and Professional Societies: Fellow, Zoological Society of India (sometime President); Member, INSA Council (1968-69).

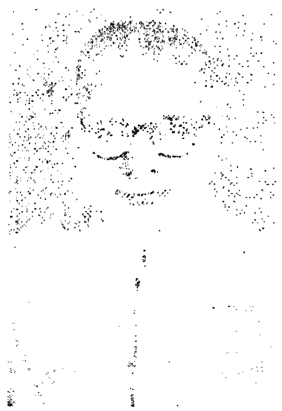
Awards and Honours: Caithness Prize (1919); President, Zoology Section, Indian Science Congress (1964-65).

Other Contributions: Founded the Centre of Advanced Study in Marine Biology of Annamalai University at Parangipettai.A great teacher, Seshaiya inspired his students. A passionate lover of books, he collected more than a thousand volumes, practically on every subject.

Died 21 February 1973.

SETH, Bhoj Raj

Elected 1961



Born 27 August 1907; Bhura, Punjab
Ph.D. (1934), D.Sc. (1937), University of London, UK; D.Sc. *(h.c.)*, Indian Institute of Technology (IIT), Kharagpur

Specialization: Mathematics

Research Achievements: Seth's work on the theory of elasticity and plasticity and fluid mechanics is well known. His work on finite strain in elastic problems gave a second-order treatment of simple torsion, pure flexure and torsion, based on a quasi- linear stress-strain relation. He gave the first complete solution for a right-angled isosceles triangle. Described the complete solution for an eccentric hollow shaft. Worked on problems of bending, vibration and stability of membranes and plates with triangular boundries and the application of finite strain theory to these problems. Standard books like 'Mathematical Theory of Elasticity' by Sokolnikoff and 'Elasticity and Plasticity' by Goodier and Hodge give ample references to his work.

Positions: Reader, University of Delhi(1939-51); Visiting Professor, Iowa State University, USA (1949-50); Professor and Head, Department of Mathematics, IIT, Kharagpur (1951- 66); Visiting Professor, Mathematics Research Centre, University of Wisconsin, USA (1961-62), Oregon State University, USA (1967-68); Vice-Chancellor, Dibrugarh University (1966-71); Visiting Fellow, IIT, Delhi (1971); Director, Birla Institute of Technology and Science, Pilani (1971-77).

Learned and Professional Societies: Fellow, Calcutta Mathematical Society and Indian Mathematical Society.

Awards and Honours: Euler Medal (USSR Academy of Sciences) (1958); Dr. B.C. Roy National Award (1977); President Mathematics Section, Indian Science Congress (1955).

Author/Editor Facet: Seth served as editor for Indian Mathematical Society's publications. The extension lectures he delivered at the University of Lucknow were published as a monograph 'Two-Dimensional Boundary Value Problems'.

Other Contributions: Seth was largely responsible for the formation of Delhi University Teachers' Association.

Died 12 December 1979.

SETHNA, Homi Nusserwanji

Elected 1970

Born 24 August 1923; Bombay, Maharashtra
M.S.E. (1946), University of Michigan, USA; D.Sc. (h.c.) from 13 Universities; LL.D. (h.c.), University of Bombay

Specialization: Production Engineering, Nuclear Engineering, Chemical Engineering

Research Achievements: Sethna was responsible for the design, construction and commissioning of several national projects like the rare earths plant at Alwaye (1949), which marked the beginning of the exploitation of nuclear materials in India, thorium plant at Trombay and the plant for production of nuclear- grade uranium metal, 40 MW research reactor (CIRUS), plutonium plant at Trombay, and uranium mill at Jaduguda, Bihar.

Positions: Principal Secretary (1981-83), Secretary (1972- 83), to the Government of India, and Chairman, Atomic Energy Commission (1981-83); Director (1966-72), Director of Engineering Group (till 1966), Bhabha Atomic Research Centre, Bombay.

Learned and Professional Societies: President (First), Maharashtra Academy of Sciences; Fellow, Indian National Academy of Engineering; Life Member, Indian Academy of Sciences and Institution of Engineers (India); Member, Royal Swedish Academy of Engineering Sciences and Indian Institute of Chemical Engineers.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1960); University of Michigan's Sesquicentennial Award (1967); Sir Walter Puckey Prize (Institution of Production Engineers) (1971); Sir William Jones Memorial Medal (Asiatic Society) (1974); Sir Devaprasad Sarbadhikari Gold Medal (University of Calcutta) (1975); President, Indian Science Congress (1976); Durga Prasad Khaitan Medal (Asiatic Society) (1983); Vishwa Gurjari Award (1985); Dadabhai Naoroji

Memorial Prize (1985); Pandit Jawaharlal Nehru Award (1989); Padma Shri (1959); Padma Bhushan (1966); Padma Vibhushan (1975).

Policy-making Bodies: Member, Study Team on Scientific Departments, Administrative Reforms Commission (1958), Scientific Advisory Committee of IAEA, UN Scientific Advisory Committee (1970), Scientific Advisory Committee to the Union Cabinet (1959- 83) Governing Council of TIFR, Bombay (1972- 83); Chairman, Fertilizer Corporation of India Ltd (1970-73), Board of Governors, IIT, Bombay (1971-74), Tata Memorial Centre Bombay, consisting of Tata Memorial Hospital and Cancer Research Institute (1972-83), Chairman, Electronics Corporation of India Ltd (1973-79), Indian Rare Earth Ltd (1974-78).

Other Contributions: Sethna has served industry in various capacities as Chairman/Member/Trustee of a large number of governmental/non-governmental bodies.

Address: "Panorama", 203 Walkeshwar Road, Malabar Hill, Bombay 400 006; Tel: 362 1654, 3692550.

SETHUNATHAN, Nambrattil

Elected 1990

Born 2 June 1937; Madras, Tamil Nadu
Ph.D. (1967), University of Madras

Specialization: Pesticide Microbiology and Microbiology of Rice Soils

Research Achievements: Sethuraman has done extensive work on microbial degradation of pesticides in flooded rice soils. He was the first to demonstrate that loss of control of a pest after regular use of a pesticide (diazinon) is related to its accelerated degradation by adapted microorganisms. A *Flavobacterium* sp., ATCC 27551, which he isolated is one of the microorganisms most intensively studied in relation to molecular aspects of enhanced degradation. His group has isolated bacteria capable of degrading not only α and γ isomers, but also thermodynamically stable β-and δ-isomers of hexachlorocyclohexane under aerobic conditions.

Positions: Principal Scientist (1983-), Head, Division of Soil Science and Microbiology (1981-87), Scientist (Microbiology) (1971-82), all at Central Rice Research Institute, Cuttack; Visiting Assistant Pesticide Chemist, International Rice Research Institute, Los Banos, Philippines (1968-71).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Agricultural Sciences (India).

Author/Editor Facet: Editor-in-chief, *Oryza* (1981-85); member, editorial boards of: *J. Environ.Sci. (Pt B), Proc. Indian Nat. Sci. Acad. (Biol. Sci.,* 1992-), and *Biology and Fertility of Soils.*

Address: Principal Scientist, Central Rice Research Institute, Cuttack 753 006; Tel: (0671) 20020 (Off), 35104 (Res); Telex: 076-220.

SETNA, Sam Bomansha

Elected 1943

Born 1 June 1895; Lahore, Pakistan
Ph.D., University of Cambridge, UK

Specialization: Fisheries

Research Achievements: Setna was one of the pioneers in fisheries development in India. He established the Fisheries Department from scratch and nurtured it. He was responsible for persuading fishermen and businessmen to introduce fast- moving launches for bringing the abundant supplies of mackerel and sardines from the North Canara coast to the thriving markets of Bombay.

Positions Fisheries Officer and Director of Fisheries, Bombay; Consultant, Taiyo Fishing Company; Managing Director, New India Fisheries Limited.

Learned and Professional Societies: Fellow, Royal Microscopical Society (London), Zoological Society of India, and Bombay Natural History Society.

Awards and Honours: Chandrakala Hora Medal (INSA) (1950).

Author/Editor Facet: Served as editor of *J. Bombay Nat. Hist. Soc.*

Other Contributions: Established the Taraporewala Aquarium and Marine Biology Research Station.

Died 29 September 1969.

SEYMOUR SEWELL, Lt-Col. Robert Beresford

Elected 1936

Born 5 March 1880; Leamington, England
M.R.C.S., L.R.C.P. (1907), University of London, UK; Sc.D., University of Cambridge, UK

Specialization: Zoology, Anthropology

Research Achievements: Seymour Sewell's contributions cover zoological, geographical, oceanographical, anatomical, medical and anthropological disciplines. The researches he carried out as Surgeon-Naturalist to the Marine Survey of India were considered to be of great value to marine zoology and oceanography. After retirement he led the John Murray Oceanographical Expedition in the Arabian Sea.

Positions: Indian Medical Sevice (1908): Surgeon-Naturalist, Marine Survey of India; Offciating Professor of Biology, Calcutta Medical College; Health Officer, Port of Aden; Officiating Superintendent and Director, Zoological Survey of India.

Learned and Professional Societies: Fellow, Asiatic Society (President, 1930-32) and The Royal Society, London.

Awards and Honours: CIE (1933); Barclay Medal (Asiatic Society) (1932); President, Zoology Section (1927), Anthropological Section (1929) and General President (1931), Indian Science Congress.

Died 11 February 1964.

SHAH, Jaysukh Jagmohandas

Elected 1980

Born 10 September 1924; Jambusar, Gujarat
Ph.D. (1957), M.S. University of Baroda

Specialization: Plant Morphology, Anatomy, Wood Science

Research Achievements: Shah's main research contributions relate to the structure and development of economic plants, gum and gum- resin producing tissue systems, sapwood-heartwood formation in forest trees, morphogenetic studies in tendrils and axillary buds and systematic anatomy of phloem. He has investigated the sites of gum and gum-resin production and their mode of secretion into the canal and established ethylene-induced increased flow of exudation. Correlated histochemical parameters with the biochemical events in heartwood formation, and established the intergrading patterns of the origin of shell zone.

Positions: INSA Senior Scientist (1985-87); UGC Emeritus Fellow (1984); Professor of Botany, and Head, Department of Biosciences, Sardar Patel University, Vallabh Vidyanagar (1968-84); Visiting Professor, Cornell University, USA (1976-77).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Indian Botanical Society, and Gujarat Academy of Sciences; Member, Executive Council, International Association of Wood Anatomists, The Netherlands (1985-87, 1988-90).

Awards and Honours: Hari Om Ashram Bhaikaka Award (1969-70, 1971- 72, 1979-80, 1981-82, 1982-83); Prof. V. Puri Medal (Indian Botanical Society) (1984); UGC National Lecturer (1977-78).

Address: 29, HIG, Freedom Fighter Nagar, Near Samta Society, Vadodara 390 021; Tel: (0265) 326421.

SHAH, Raman Vadilal

Elected 1987

Born 26 March 1926; Ahmedabad, Gujarat
Ph.D. (1956), M.S. University of Baroda

Specialization: Developmental Physiology and Comparative Chordate Anatomy

Research Achievements: Shah established the basic structural and physiological aspects of reptilian tail regeneration. Explained the mechanism of respiration in Chelonia on the basis of functional anatomy of the respiratory system.

Positions: Head, Department of Zoology, M.S. University of Baroda (1967-83).

Learned and Professional Societies: Fellow, National Academy of Sciences (India); Founder Member (now President) Society of Animal Morphologists and Physiologists.

Author/Editor Facet: Editor, *J.Anim. Morphol. Physiol.,* and *Pavo (Indian. J. Ornithol.)*

Other Contributions: Shah is engaged in popularizing science at school level.

Address: 7, Indraprastha, New Sama Road, Vadodara 390 008; Tel: (0265) 22375.

SHAH, Ramanlal Chhaganlal

Elected 1941

Born 7 October 1899; Pardi, Gujarat
Ph.D. (1931), University of London, UK

Specialization: Organic Chemistry

Research Achievements: Shah's researches covered imidochlorides; coumarins and chromones; γ-substitution in the resorcinol nucleus; fixation of the Kekule double bonds; chemistry of natural products (oroxylin, wogonin, calycopterin, anacardic acid, etc); saccharin chloramine-T and synthetic drugs; DDT and synthetic insecticides. Of special significance are his use of dry ether as a solvent for anhydrous aluminium chloride in Prechmann reaction, which made 5-hydroxycoumarins readily available. His studies on γ-substitution made available γ-substituted resorcinol derivatives like γ-resorcylaldehyde, and γ-formulated polyhydroxy ketones - compounds which were not readily available earlier. Shah also did some outstanding work in applied chemistry. He invented a new process for the manufacture of chloramine-T, which was taken up by the Government of India for the manufacture of Antigas Ointment No. 2 for use by Defence Services.

Positions: Head, Department of Chemistry, Ismail Yusuf College, Bombay; Professor of Organic Chemistry, Institute of Science, Bombay; Assistant Director, Deputy Director and Head, Organic Chemistry Division, National Chemical Laboratory, Pune; Development Officer (Antigas) and Deputy Director of Chemicals, Government of Bombay.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Indian Chemical Society (sometime President); Member, *Gujarat Parishad* (President, 1949).

Awards and Honours: Acharya P.C. Ray Medal (Indian Chemical Society); K.G. Naik Gold Medal (M.S. University of Baroda); President, Chemistry Section, Indian Science Congress (1951); Government of India's Reward (for Chloramine-T Process).

Died 3 September 1969.

SHAH, Swarupchand Mohanlal

Elected 1952

Born 30 December 1905; Dessa, Gujarat
Ph.D. (1942), University of London; D.Litt. (1951), University of London, UK; D.Sc. *(h.c.)* (1978), University of Kentucky, USA

Specialization: Complex and Real Analysis

Research Achievements: Shah has made significant contributions to complex analysis, Fourier analysis, and differential equations. He has been working on growth and index problems of a class of differential equations.

Positions: Emeritus Professor of Mathematics, Department of Mathematics, University of Kentucky, USA; Visiting Professor, University of Wisconsin, North Western University, USA, University of Kansas, USA and University of Kentucky, USA.

Learned and Professional Societies: Fellow, Royal Society of Edinburgh and Indian Academy of Sciences; Member, American Mathematical Society, Indian Mathematical Society, Mathematical Association of America, and Sigma Xi.

Author/Editor Facet: Co-authored three books including 'Introduction to Real Variable Theory' and 'An Introduction to Summability Theory and Applications'; editor, *J. Indian Math. Soc.,* and *Math. Student;* associate editor, *Proc. Amer. Math. Soc., Indian J. Math.,* and *Indian J. Pure Appl. Math.*

Address: Department of Mathematics, University of Kentucky, Lexington, Kentucky 40506, USA; Tel:606-257-4090; Res: C/o Dr K.L. Shah, Professor of Civil Engineering, Ohio Northern University, ADA, Ohio, 45810, USA; Tel: 419-634-5803.

SHAH, Vinodkant Chunilal

Elected 1985

Born 27 November 1929; Sankheda, Gujarat
Ph.D. (1962), Columbia University, USA; D.Sc. *(h.c.),* University of Arizona, USA

Specialization: Cell Biology-Cell Genetics

Research Achievements: Shah has worked in cell biology, cytogenetics, genetics and radiation biology. He was the first to develop culture media for amphibian cells. He is among the first few to work on the effects of antibiotics and specific antimetabolites on cell cycles to gain insight into its regulatory mechanisms. Contributed to studies on *Euglena* chloroplast genome--its transcriptional activities, *in vitro* replication and origin. His pioneering studies of specific inhibitions of nuclear

RNA by actinomycin-D and specific breaks induced by mitonycin-C in heterochromatic regions stimulated a good deal of interest for finding specific agents to work on specific regions of cell and chromosomes. With Dr Rao, he provided cytological proof of the validity of Lyon's hypothesis. Studied cellular enzymes during low-level radiation and repair. He has also done biochemical, cytochemical and genetic studies on leucoderma.

Positions: Vice-Chancellor, M.S. University of Baroda, Vadodara (1990-); Vice-Chancellor, Bhavnagar University, Bhavnagar; Professor and Head, Department of Zoology, Director, University School of Sciences, Gujarat University, Ahmedabad; Visiting Professor at many universities.

Learned and Professional Societies: Fellow, National Academy of Sciences (India); and Gujarat Academy of Science (President); President/Vice-President, Gujarat Bioscience Society (1972-77), All India Cell Biology Society (1986-88), Environmental Mutagen Society of India (1989-92), Asia Pacific Organization of Cell Biologists (1988-90), and International Federation for Cell Biology (1988-92).

Awards and Honours: K.G. Naik Gold Medal (1975); Hari Om Mota Prerit Jayakrishna Inderjit Award (1975-76, 1977-78); Vikram Sarabhai Award (1992); Visiting Professorships at several universities/research councils in Japan, Germany,USA,Canada and former Soviet Union; Sectional President, Indian Science Congress (1988-89); UGC National Lecturer (1983-84).

Author/Editor Facet: Published three books in the area of radiation and cell biology; served as member of editorial boards of several journals including *Acta Histochem.* and *Indian J. Exp. Biol.*;chief editor, *Vidya.*

Policy-making Bodies: Member of several university boards of studies/academic councils.

Address: Vice-Chancellor, M.S. University of Baroda, Vadodara 390 002; Tel: (0265) 329159; Telex 0175678 MSU IN; Fax: 91-265- 329283; Res: Dhanwantri University Road, Vadodara 390 002; Tel: (0265) 329283.

SHANKAR, Jagdish

Elected 1969

Born 3 October 1912; Agra, Uttar Pradesh
Ph.D. (1939), University of Bombay

Specialization: Nuclear and Radiation Chemistry

Research Achievements: Shankar contributed to studies on consequences of recoiling atoms in solid metal complex and radiation damage. The model he proposed could explain all the previous results. He made significant contributions to radiation chemistry of aqueous solutions of substances using Cobalt-60 gamma rays. His postulate that the ejected electron can form a pair with an ion molecule was widely accepted. He also worked on X-rays and crystal structure.

Positions: Head, Chemistry Division, Bhabha Atomic Research Centre, Bombay; Adviser, Department of Atomic Energy; Director, Science Research Council, UGC; Professor, Centre for Ecodevelopment, University of Kashmir.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Indian Chemical Society (sometime President).

INSA has instituted 'Dr. Jagdish Shankar Memorial Lecture'.

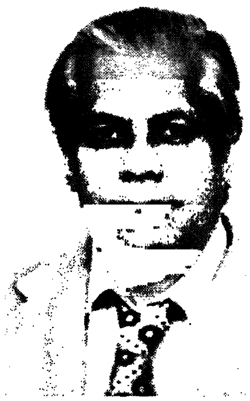
Died 31 January 1992.

SHANMUGAM, Govindaswamy

Elected 1993

Born 18 December 1938; Vallampadugai, Tamil Nadu
Ph.D. (1968), Osmania University, Hyderabad

Specialization: Cell Biology



Research Achievements: Shanmugam has characterized retroviral proteins and nucleic acids. Discovered a double stranded RNA- specific nuclease involved in the processing of ribosomal and retroviral RNAs. Also identified an endonuclease capable of cleaving Holiday junctions with implications in eukaryotic recombination. His recent contributions are in signal transduction in cell cycle.

Positions: Professor and Head, Department of Biochemistry and Cancer Biology,School of Biological Sciences, Madurai Kamaraj University, Madurai (1984-); Visiting Professor of Cell Biology, Vanderbilt University School of Medicine, USA (1987); Assistant Professor of Molecular Virology, St Louis University.School of Medicine, USA (1974-78).

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Member, American Society for Microbiology and New York Academy of Sciences.

Awards and Honours: ICMR Award (1984); UGC National Lecturer (1987).

Author/Editor Facet: Authored: 'Laboratory Manual of Cell Biology' (Macmillan India, 1988).

Address: Professor and Head, Department of Biochemistry and Cancer Biology, Madurai Kamaraj University, Madurai 625 021; Tel: (0452) 85226; Telex: 445-303-MKU-IN; Fax: 91-452-85205; E-mail: mic/mku @ imtech-ernet-in; Res: (0452) 85228.

SHARIF, Mohammad

Elected 1939

D.Sc., Panjab University, Lahore; Ph.D. (1936), University of Cambridge, UK

Specialization: Zoology

Research Achievements: Sharif did a great deal of work on Indian ticks and fleas, and the genus *Rhipicephalus*. He was considered an authority on *Acarina* and *Siphonaptera*.

Positions: Entomologist, Bombay Medical Service; Assistant Superintendent, Zoological Survey of India and Imperial Council of Agricultural Research.

Learned and Professional Societies: Fellow, Linnaean Society (London).

t: Sharif was commissioned by the Secretary of State for India to write two volumes on the ticks and fleas in *Fauna of British India* series.

Died 10 October 1965.

SHARMA, Archana

Elected 1977

Born 16 February 1932; Pune, Maharashtra
D.Sc. (1960), University of Calcutta

Specialization: Cytogenetics, Human Genetics, Environmental Mutagenesis

Research Achievements: Sharma has developed new techniques for studying chromosome structure, applied throughout the world, and deduced evidences of a new concept of speciation in vegetatively reproducing plants. Her other studies relate to induction of division in adult nuclei and cause of polyteny in differentiated

tissue in plants; cytotaxonomic investigation on flowering plants; assessment of chromosomal and genetical polymorphism in normal human populations in eastern India and their comparison with pathological conditions; differentiation patterns in human fibroblasts in relation to polyteny as a factor in ageing; genetic polymorphisms in relation to environmental agents on living systems; clastogenic and mutagenic effects of various pesticides and metals on multiple test systems; assessment of genotoxic and clastogenic activity of environmental agents in subtoxic doses in exposed populations in relation to different modifying factors like diet, genetic predisposition, drugs, etc.; and use of dietary factors and plant products in modulating the cytotoxicity of known pollutants—metals and pesticides.

Positions: Professor of Genetics, Centre of Advanced Study in Cell and Chromosome Research, Department of Botany, University of Calcutta, Calcutta.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India); Indian Botanical Society (President 1989); Member, International Academy of Science (Germany) (1990); Member, INSA Council (1980-82).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1976); J.C. Bose Award (UGC) (1974); UGC National Lecturer (1980); FICCI Award (1983); Birbal Sahni Medal (India Botanical Society) (1984); President, Indian Science Congress (1986-89); Padma Bhusan (1984).

Lectureships: Platinum Jubilee Lecture (Indian Science Congress Association) (1989).

Author/Editor Facet: Written eight books including 'Chromosome Techniques - Theory and Practice', 'The Chromosomes', 'Methods in Human Genetics'; edited 15 books; co-editor, Nucleus; member, editorial boards of: *Indian J.Exp.Biol., Proc. Indian Nat. Sci. Acad.* and many other journals.

Policy-making Bodies: Member, Science and Engineering Research Council; Environmental Research Council (Union Ministry of Environment); Panel for Cooperation with Unesco, Department of Education, and Member, various technical committees of UGC, DST, DBT and other bodies.

Address: Professor, Centre for Advanced Study in Cell and Chromosome Research, Department of Botany, University of Calcutta, 35 Ballygunj Circular Road, Calcutta 700 019; Tel: (033) 4753681; Res: Flat 2F (2), Meghmallar, 18/3 Gariahat Road, Calcutta 700 019; Tel: (033) 4405802.

SHARMA, Arun Kumar

Elected 1970

Born 31 December 1924; Calcutta, West Bengal
D.Sc. (1955), University of Calcutta, D.Sc. *(h.c.)*,
University of Burdwan, West Bengal

Specialization: Cytogenetics, Cytochemistry and Cell Biology

Research Achievements : Sharma's contributions include: new techniques for studying the physical and chemical nature of chromosomes, adopted all over the world for plant, animal and human systems, the latest technique being orcein banding for repetitive DNA; repeat DNA analysis as a measure of genetic diversity; a new concept of speciation in asexual organisms; clarification of the chemical nature of plant chromosomes through techniques specially evolved; inducing division in adult nuclei through certain metabolic precursors for studying chromosomes in relation to differentiation; reorientation of angiosperm taxonomy; a new concept of dynamism of structure and behaviour of chromosomes in plant, animal and human systems; using embryo irradiation and *in- vitro* cultures for generating variability; the concept of dynamic DNA; and tissue culture as a means of genetic variability and conservation of endangered species. Sharma has shown that the chemical composition of chromosomes varies during organogenesis, differentiation and reproduction, with the basic genetic skeleton being maintained.

Positions: Sir Rashbehary Ghose Professor, Director, and INSA Golden Jubilee Research Professor (1985-90); all at Centre of Advanced Study on Cell and Chromosome Research, Department of Botany, University of Calcutta.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India); President, Indian Society of Cytologists and Geneticists (1976-78), Botanical Society of Bengal (1977-79), Genetic Association of India, Society of Cell Biology (1979-80), and Indian Botanical Society (1980); Founder President, Federation of Asian Scientific Academies and Societies (FASAS) (1984-89); President, INSA (1983- 84).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1967); Jawaharlal Nehru Fellowship (1972);Paul Brühl Memorial Medal (Asiatic Society) (1972); Birbal Sahni Medal (Indian Botanical Society) (1974); J.C. Bose Award (UGC) (1976)); Silver Jubilee Medal (INSA) (1976); UGC National Lecturer (1977); FICCI Award (1979); President, Indian Science Congress (1981); Padma Bhushan (1983).

Author/Editor Facet: Authored/co-authored a reference book 'Chromosome Techniques: Theory and Practice' (Butterworths); written chapters in *Bot. Rev.* and

Int. Rev. Cytol (Academic Press); 'Encyclopaedia of Microtechniques' (Van Nostrand), 'The Cell Nucleus' (Academic Press), 'Tropical Botany' (Academic Press), and others; edited/co-edited *Nucleus*; member of editorial boards of many journals.

Policy-making Bodies: Chairman, Indian National Committee of IUBS-INSA (1978) and Man and Biosphere Committee, Department of Environment, Government of India (1981-89); served on the governing bodies of CSIR and other research councils; Chairman, FASAS Commission on Science and Technology for Development in Asia (1990-); Co-chairman , Global Continuing Committee on Role of Scientific and Engineering Societies in Development (AAAS-INSA-ISCA), (1980-); Member, Executive Committee, IUBS, Paris (1982-85), IUBS Steering Committee on Biological Monitoring of the State of Environment (1983-); and Board of Trustees, International Foundation for Science, Stockholm (1984-87); Chairman, G-15 Scientific Advisory Committee Meeting on Gene Bank, India (1992).

Address: Centre of Advanced Study, Department of Botany, University of Calcutta,35, Ballygunge Circular Road, Calcutta 700 019; Tel: (033) 4753682, 4754681; Res: Flat No. 2F(2), Meghmallar, 18/3 Gariahat Road, Calcutta 700 019; Tel: (033) 4405802.

SHARMA, Ganpati Parshad *Elected 1962*

Born 11 December 1917; Ambala, Haryana
Ph.D. (1945), Panjab University, Lahore, Pakistan;
Ph.D. (1947), University of Edinburgh, UK

Specialization: Cytology (Nuclear and Cytoplasmic)

Reasearch Achievements: Sharma has elucidated the role of cytoplasmic inclusions like the mitochondria and golgi elements in the formation of gametes and that of chromosomes in speciation. This piece of research is considered highly significant. He also studied the effects of environmental chemicals on the genome of invertebrates (mosquito) and vertebrates (rat and man).

Positions: CSIR Emeritus Scientist; Professor and Head, Department of Zoology, (1959-1977); Dean, University Instruction (1967-69); Senate Fellow, (1964-72 and 1975- 84); Syndicate Member (1964-72, 1976-81); Dean, Faculty of Science and Mathematics (1973-75, 1982), all at Panjab University, Chandigarh

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Academy of Zoology (Agra), Indian Academy of Zoology (Lucknow), Zoological Society of India, Zoological Society (London), Royal Microscopical Society (London), and Society of Cytologists and Geneticists, (Bangalore); Member, INSA council (1977-79).

Awards and Honours: UGC National Lecturer (1979-80).

Address: CSIR Emeritus Scientist, Department of Zoology, Panjab University, Chandigarh 160 014; Tel: (0172) 541942; Telex: 172- 395-464; Fax: 91-172-541409; Res: House No. 505 P, Sector 36 B, Chandigarh 160 036; Tel: 533706.

SHARMA, Kamal Nath

Elected 1978

Born 17 November 1929; Mussoorie, Uttar Pradesh
M.D. (1959), University of Lucknow

Specialization: Neurophysiology, Nutrition and Biocontrols

Research Achievements: Sharma's researches have contributed to our understanding of the fundamental concepts and their clinical significance in the fields of feeding behaviour and neural control systems, ecology of hunger and malnutrition, systems organization in homeostatic motivations, and spatio-temporal delineation of neuro-humoral events linked to pain mechanisms and management.

Positions: Director, Centre for Brain Research & Human Development (1988-), Principal (1980-), Professor & Head, Department of Physiology (1976-), all at University College of Medical Sciences, Delhi; Professor & Chairman, Department of Physiology, St John's Medical College, Bangalore (1964- 76); Research Associate Professor of Physiology & Psychology (1962- 64), University of Illinois, USA.

Learned and Professional Societies: Fellow, National Academy of Medical Sciences (India) and Indian Academy of Sciences.

Awards and Honours: Amrut Mody National Research Award (1975); Anokhin Medal (USSR Academy of Medical Sciences) (1988);Sechenov Medal (USSR Academy of Sciences) (1990); Major General S.L. Bhatia Oration Award (1978).

Lectureships: Indian Science Congress Platinum Jubilee Oration (1991).

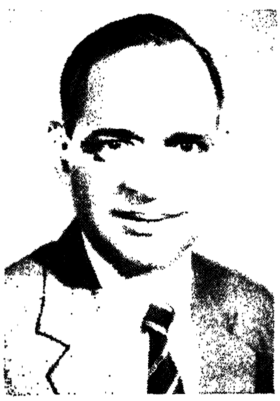
Author/Editor Facet: Published 'Canine brain in Stereotaxic Co- ordinates' (MIT Press, Boston, 1970), 'Brain and Psychophysiology of Stress' (ICMR, 1988), and 'Generic Drugs, Bioequivalence and Pharmacokinetics' (UCMS, 1990), and 5 volumes in "Current Trends in Pain Research and Therapy" series; edited/co-edited 7 journals.

Policy-making Bodies: Member, National Representative on IUPS; Commission on Food and Fluid Intake.

Address: Principal, University College of Medical Sciences, Shahdara, Delhi 110 095; Tel: 2282106, 2286262 (Off), 8768318, 8763318; Telex: 031-62032 UCMS IN.

SHARMA, Man Mohan

Elected 1976



Born 1 May 1937; Jodhpur,Rajasthan
Ph.D. (1964), University of Cambridge, UK

Specialization: Multiphase Reactions/Reactors; Separation Technology

Research Achievements: Sharma's work on multiphase reactions/reactors has brought out new strategies which result in intensifying rates of reactions or making reactions more selective. He has established links with industrial practice by way of rigorous process design in many areas. His work has made possible separation of close-boiling substances through novel reactions.

Positions: Director (1989-), Professor of Chemical Engineering (1964-), Head of the Division (1964-89), Lecturer in Chemical Engineering (1959-61), all at University Department of Chemical Technology (UDCT), University of Bombay; Shreve Distinguished Visiting Professor, Purdue University, USA (1989).

Learned and Professional Societies: Fellow, Royal Society of London, Royal Society of Chemistry (London), Indian Academy of Sciences, Institution of Chemical Engineers (UK), and Maharashtra Academy of Sciences; Hony Fellow, National Academy of Sciences (India); President, INSA (1989-90).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1973); K.G. Naik Gold Medal (M.S. University of Baroda) (1974); UGC National Lecturer (1977); Herdillia Award (Indian Institute of Chemical Engineers) (1979); FICCI Award (1981); Best Teacher Award (Government of Maharashtra) (1984); Vishwakarma Medal

(INSA) (1985); Om Prakash Bhasin Award (1985); Distinguished Alumnus Award (UDCT) (1985); Indian Chemical Manufacturers Association's First Award (1990); G.M. Modi Award (1991); Moulton Medal (Institution of Chemical Engineers, UK) (1971, 1977); Padma Bhushan (1987).

Lectureships: Danckwerts Memorial Lecture (1987); Dr. H.L. Roy Memorial Lecture (1987); P.C. Ray Lecture (Indian Chemical Manufacturers Association) (1988); CSIR Distinguished Lectures (1989); Jawaharlal Nehru Lecture, (Indian Science Congress) (1989); and several others.

Author/Editor Facet: Co-authored 'Heterogeneous Reactions: Analysis, Examples and Reactor Design' (2 vols) (Wiley Interscience); editor, *Chem. Engng. Sci.* (1975-86); Associate Editor, *Trans. Inst. Chem. Engrs* (1973-86); member, editorial board, *Proc. Indian Acad. Sci.* (1981-83; 1987).

Policy-making Bodies: Served on National Committee on Science and Technology and Scientific Advisory Committee to Union Cabinet; Chairman, Scientific Advisory Committee, Ministry of Petroleum & Natural Gas (8 years); Member, UGC.

Address: Director, University Department of Chemical Technology, Matunga, Bombay 400 019; Tel: (022) 4145616; Fax: 91-22-4145614; Res: Director's Flat, UDCT Main Building, Matunga, Bombay 400 019; Tel: (022) 4140869.

SHARMA, Ram Swaroop

Elected 1992

Born 10 July 1937; Jaipur, Rajasthan
Ph.D. (1968); University of Basel, Switzerland

Specialization: Metamorphic Petrology

Research Achievements: Sharma has worked on tectono- metamorphic evolution of Archaean gneisses and granulites from Rajasthan. He deduced an anticlockwise movement path in P-T space for these rocks from their mineralogy and thermodynamic models of geothermobarometry, which may constrain geological evolution of the Aravalli mountain. Proposed petrological criteria to distinguish basement from the cover rocks of this region.

Positions: Professor, Department of Geology, Banaras Hindu University, Varanasi; Visiting Professor, School of Applied Geology, Curtin University of Technology, Perth, Australia.

Learned and Professional Societies: Fellow, Swiss Mineralogical Society and Indian Academy of Sciences.

Author/Editor Facet: Member, editorial board of International Geological Correlation Programme.

Policy-making Bodies: Member, International Commission on Lithosphere (1981-84); Programme Advisory Committee, DST (1989-).

Address: Professor, Department of Geology, Banaras Hindu University, Varanasi 221 005; Res: G-8, Arvindo Colony, BHU, Varanasi 221 005; Tel: (0542) 312359.

SHARMA, Tikaram

Elected 1988

Born 29 March 1935; Kurseong, West Bengal
Ph.D. (1967), Banaras Hindu University, Varanasi

Specialization: Evolutionary Molecular Genetics and Cytogenetics

Research Achievements: Sharma developed a unique model system in speciating Indian pygmy field mouse (*Mus dunni*) which is suitable for critically examining the functional role of enigmatic tandemly arrayed, highly repetitve DNA in evolutionary differentiation of taxa. Using the exceedingly low number and large chromosomes of the Indian muntjac (genus *Muntiacus*) as an experimental system, he discovered for the first time, in any organism (i) differential radiosensitivity between the two sexes in terms of chromosomal aberrations, and (ii) difference with respect to SCE frequency between the homologous chromosomes.

Positions: Programme Coordinator, Centre of Advanced Study in Zoology (1990-); Head, Department of Zoology, Banaras Hindu University, Varanasi (1982-84); Professor and Director, Centre for Life Sciences, University of North Bengal (1977- 80).

Author/Editor Facet: Edited 'Trends in Chromosome Research' (Springer-Verlag and Narosa Pub. House, 1990).

Policy-making Bodies: Member, Committee of Directions, National Bureau of Fish Genetic Resources (ICAR) (1986-90), Central Crisis Group for Chemical Disasters (DOEN) (1988-).

Address: Professor & Programme Coordinator, Centre for Advanced Study in Zoology, Banaras Hindu University, Varanasi 221 005, Tel: (0542) 310291 (Ext 354); Res: P-20, New Medical Enclave, BHU, Varanasi 221 005 Tel: (0542) 311637.

SHARMA, Vinod Prakash

Elected 1983

Born 6 April 1938; Bulandshahr, Uttar Pradesh
D.Sc.(1979), University of Allahabad

Specialization: Entomology, Malariology

Research Achievements: Sharma has made contributions to several aspects of mosquito biology, vector control and malariology. He has developed a simple device for separating sexes in mosquitoes, studied sibling species complex in anophelines, and applied the results in stratifying malarious areas so as to bring about cost- effective malaria control. Developed a bioenvironmental malaria control strategy and transferred the strategy for managing malaria in the field. Also discovered the mosquito-repellent action of *neem* oil.

Positions: Director, Malaria Research Centre, Delhi (1962-)

Learned and Professional Societies: Fellow, National Academy of Sciences (India), National Academy of Medical Sciences (NAMS) (India), Indian Society for Malaria and Other Communicable Diseases, and Entomological Society of India.

Awards and Honours: Invention Award (NRDC) (1971); Om Prakash Bhasin Award (1985); Dr. R.V Rajam Oration Award (NAMS) (1987- 88); M.L. Gupta Trust Award (1989); B.N. Singh Oration Award (Indian Society of Parasitology) (1990); M.O.T. Iyengar Award (ICMR) (1990); Ranbaxy Award (1991); Padma Shri (1992).

Author/Editor Facet: Editor,*Indian J. Malariol.*; chief editor, *Proc. Nat. Acad. Sci. (India)*; edited/co-edited many symposium/workshop proceedings.

Policy-making Bodies: Council Member, International Congress of Entomology (UK); Chairman, WHO Experts Panel on Environmental Management; Member, WHO Expert Committee on Malaria; Member, ICMR Governing Body.

Other Contributions: Sharma has built up the Malaria Research Centre, one of the best anywhere in the world in the field of malaria.

Address: Director, Malaria Research Centre (ICMR), 22 Sham Nath Marg, Delhi 110 054; Tel: (011) 2247983;233743; Fax: 91-11- 7234234; Telex: 78-234 MRC IN; Res: D1/55, Satya Marg,Chanakya Puri, New Delhi 110 024; Tel: (011) 6885195.

SHASTRY, Sisata Venkata Seetharama

Elected 1984

Born 4 November 1928; Guntur, Andhra Pradesh
Ph.D. (1958), University of Wisconsin, USA

Specialization: Plant Breeding and Genetics

Research Achievements: Shastry has made cytogenetic and taxonomic study of the genus *Oryza*. Investigated the role of chromosome structural differentiation in speciation. Developed high-yielding varieties of rice with resistance to insects and diseases. Played a significant role in the development of rice varieties such as 'Jaya' and 'Phalguna'. Articulated agrotechniques that promote high rice yields. Improved management of fertilizers. Studied genetics of resistance to rice insects and diseases.

Positions: Director of Research, International Institute of Tropical Agriculture, Nigeria (1977-83); Executive Secretary, International Rice Commission, FAO, UN, Rome (1975-77).

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Member, Indian Society of Genetics and Plant Breeding.

Awards and Honours: Borlaug Award (1973); Jannareddy Venkata Reddy Medal (1975); Ramiah Centenary Medal (1992); Padma Shri (1971).

Author/Editor Facet: Technical editor : *Int. Rice Comm. NewsLett.* (1975-77).

Policy-making Bodies: Vice-Chairman, Board of Trustees, International Rice Research Institute (1970-72); Chairman, Steering Committee, West Africa Rice Development Association (1974).

Address: 'Neevaram', 74 Nagarjuna Hill, Punjagutta, Hyderabad 500 482; Tel: (0842) 227774.

SHAW, F.J.F.

Foundation Fellow

D.Sc.

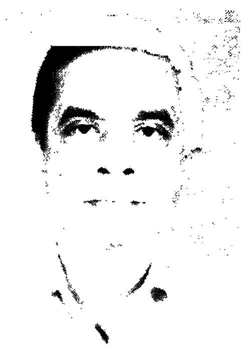
Specialization: Botany

Positions: Imperial Economic Botanist and Director, Imperial Institute of Agricultural Research, Pusa, Bihar.

Died (Date N.A.).

SHETH, Anil Ramanbhai

Elected 1993



Born 5 August 1933; Ahmedabad, Gujarat
Ph.D., University of Bombay

Specialization: Reproductive Biology, Endocrinology, Biochemistry

Research Achievements: Sheth has done extensive research on (i) regulation of male and female fertility; (ii) protein hormones with regard to purification, characterization, assay and mechanism of hormone action; and (iii) sperm physiology. He has isolated and characterized inhibin, consisting of 94 amino- acid residues, which has applications in fertility regulation and detection and therapy of prostatic cancer.

Positions: Director, Institute for Research in Reproduction, Bombay.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Maharashtra Academy of Sciences and Gujarat Academy of Science.

Awards and Honours: Basanti Devi Amirchand Award (ICMR) (1987).

Lectureships: Oration Lectures of Endocrine Society (1985) and Geriatric Society (1986); Dr Subhash Mukherjee Memorial Lecture (Indian Cryogenic Council) (1988).

Author/Editor Facet: Edited: 'Inhibins: Isolation, Estimation and Physiology' (CRC Press) (1987); Member, editorial board, *Indian J. Exp. Biol.*

Address: Director, Institute for Research in Reproduction; Jehangir Merwanji Street, Parel, Bombay 400 012; Tel: (022) 4137730, 4132111; Fax: 91-22-4139412; Res: Fulchand Niwas, I Floor, Chowpatty Sea Face, Bombay 400 012; Tel: (022) 3613755, 3611289.

SHOREY, Tarlok Nath

Elected 1986

Born 30 October 1945 ; Patti, Punjab
Ph.D. (1976), University of Bombay

Specialization: Theory of Numbers

Research Achievements: Shorey's contributions relate to estimates for the theory of linear forms in logarithms; applications of this theory; and exponential diophantine equations.

Positions: Professor, School of Mahematics, Tata Institute of Fundamental Research, Bombay (1968-).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1987).

Author/Editor Facet: Co-authored: 'Exponential Diophantine Equations' : (Cambridge Tracts in Mathematics) (1986)

Address: School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152971 (Ext 222); Fax: 91-22-2152181; E-mail: tns@tifrvax.bitnet; Res: 403, Meghnad, TIFR Housing Colony, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2151802.

SHORTT, Lt. Col. Henry Edward

Elected 1936

Born 15 April 1887; Dhariwal, Punjab
LL.D. (1952), University of Aberdeen, UK

Specialization: Parasitology and Protozoology

Research Achievements: Shortt conducted studies on the sandfly fever virus and made an attempt at prophylactic vaccination. Discovered the transmitting agent (*Phlebotomus argentipes*) of kala-azar and the cryptic stage of malaria in the liver. Described the complete life-cycle of *Babesia canis* and described and named endemic fluorosis cause, symptoms and pathology. Did work of significance on antirabic treatment. Also worked on Indian tick typhus fever and conducted an enquiry on the filtrable viruses.

Positions: Indian Medical Service; Director, Indian Institute of Preventive Medicine, Guindy, Madras.

Learned and Professional Societies: Fellow, Royal Society of London; President, Royal Society of Tropical Medicine and Hygiene (1949-51); Hony Member, American Society of Parasitologists.

Awards and Honours: *Kaiser-i-Hind* (1945); King's Hony Physician (1941-44); Mary Kingsley's Medal; Darling Medal (1952); CIE (1941); Straits Settlement Gold Medal (1938).

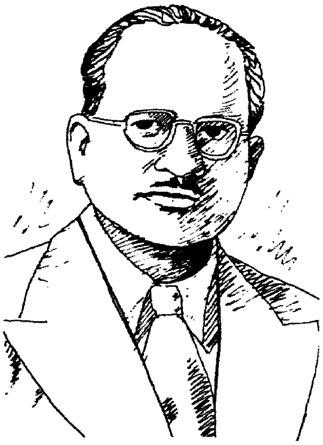
Died (Date N.A.).

SHRI RANJAN

Elected 1951

Born 16 August 1899, Varanasi, Uttar Pradesh
D.Sc., University of Toulouse, France

Specialization: Plant Physiology



Research Achievements: Shri Ranjan did a great deal of work on plant respiration, and proved that light profoundly affects the rate of respiration of a green plant. He carried out physiological investigations for improving agricultural crops. Produced new mutant types of Pusa wheat by exposure to X-rays. Showed that the application of molasses to soil results not only in an increase of soil nitrogen but also in the nitrogen content of the plant and its carbohydrate and chlorophyll contents as well as its yield.

Positions: Head, Department of Botany and Dean, Faculty of Science, University of Allahabad; Vice-Chancellor, Agra and Allahabad universities.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Member, Indian Botanical Society (President, Jubilee Session, Allahabad 1946); Additional Vice-President, INSA (1954- 55, 1958-59).

Awards and Honours: President, Botany Section, Indian Science Congress (1941).

Died 8 July 1969.

SHRIKHANDE, Sharadchandra Shankar

Elected 1963

Born 19 October 1917, Sagar, Madhya Pradesh
Ph.D. (1950), University of North Carolina, USA

Specialization: Combinatorics & Graph Theory

Research Achievements: Shrikhande has worked on combinatorial problems of design of experiments and related graph- theoretic problems. His most significant contribution has been the disproof of a celebrated conjecture of Euler on the non-existence of mutually orthogonal Latinsquares of order $4t+2$ made in 1782.

Positions: Director, Mehta Research Institute, Allahabad; Professor of Mathematics and Director, Centre of Advanced Study in Mathematics, University of Bombay (1963-78); Professor of Statistics, Banaras Hindu University, Varanasi (1960-63).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Maharashtra Academy of Sciences, and Institute of Mathematical Statistics (USA); Member, International Statistical Institute and Indian Statistical Institute; Member, INSA Council (1969-71).

Author/Editor Facet: Member, editorial board, *Indian J. Pure Appl. Math., Utilit Mathemat.,* and *J. Stat. Plann. Infer.*

Address: Pukhraj, South-Ambazari Road, Laxminagar, Nagpur 440 022; Tel: (0712) 32334.

SIDDIQI, Mohammad Razuiddin

Elected 1937

Born 2 January 1908; Hyderabad,Deccan
Ph.D. (1931), University of Leipzig, Germany; D.Sc. (*h.c.*) Osmania University, Hyderabad

Specialization: Mathematical Analysis

Research Achievements: Siddiqi obtained far-reaching and comprehensive results in the theory as well as boundary value problems of generalized non linear partial differential equations of parabolic, elliptic and hyperbolic types, and in demonstrating the existence and uniqueness of the solutions. Also, obtained solutions of systems of non linear integrated equations and integro-differential equations.

Positions: Professor, Director of Research, and Vice-Chancellor of four universities in the Indo-Pakistan subcontinent, viz. Osmania, Peshawar, Sind and Quaidi-Azam; Chief of Higher Education, Ministry of Education, Government of Pakistan; Head, Ministerial Division for Higher Education and Scientific & Technological Research, Government of Pakistan; Visiting Professor, Columbia University, USA (1959- 60); Distinguished Visiting Professor, Midwest Universities Consortium, USA (1973- 74).

Learned and Professional Societies: President, Indian Mathematical Society; Foundation Fellow, Indian Academy of Sciences (Vice-President), National Academy of Sciences (India), Pakistan Academy of Sciences (Secretary General and President) and Islamic Academy of Sciences; Member, International Mathematical Union; General President, Pakistan Association for the Advancement of Science (1951).

Awards and Honours: Star of the Order of Distinction(President of Pakistan) (1960); Ground Cross of the Order Merit (President of Germany) (1962); Crescent of the Order of Distinction (President of Pakistan) (1980); President, Pakistan Association of Scientists; Chairman, Commonwealth Universities Association (1957); Inter-University Board of Pakistan (1957, 1962, 1970); General President, International Congress of Mathematical Sciences (1975).

Author/Editor Facet: Authored many books including (i) 'Boundary Value Problems on Non-Linear Partial Differential Equations' (University of Lucknow, 1938), and (ii) 'Lectures on Quantum Mechanics' (Osmania University, 1940).

Policy-making Bodies: Special Consultant for Science, Unesco, Paris (1963);

Other Contributions: Since 1950, Siddiqi has served on governing boards/committees and councils of almost all universities, senates and academic councils and also as adviser or consultant to scientific organizations in Pakistan

Address: Pakistan Academy of Sciences, Constitution Avenue G-5, Islamabad, Pakistan; Tel: 827789; Res: House No. 2, Kohsar Road, F-7/3, Islamabad, Pakistan; Tel: 214944.

SIDDIQI, Obaid *Elected 1977*

Born 7 January 1932; Basti, Uttar Pradesh
Ph.D. (1961), University of Glasgow, UK; D.Sc. (*h.c.*), Aligarh Muslim University (1984) and Banaras Hindu University, Varanasi (1991)

Specialization: Molecular Genetics

Research Achievements: After some early research in plant embryology and wheat genetics, Siddiqi mapped the fine- structure of the *Paba* gene of *Aspergillus*, while at Glasgow. His work provided a strong evidence for polarized intragenic recom-

bination. At the University of Pennsylvania, Siddiqi and Garen discovered the suppressors of 'nonsense' mutations and this work led to the discovery, at TIFR, of 'nonsense' codons, the stop signals in the genetic code. He and his associates were able to show that DNA transfer can be dissociated from replication, and that recombinant DNA molecules can arise from conserved unreplicated DNA. He has also done much work on behavioural genetics and neurobiology of *Drosophila*. He and his associates have done pioneering work on neurogenetics of the chemical sense of *Drosophila*, identifying a series of genes whose mutations block olfactory or gustatory responses. Their work has opened up the prospect of an integrated genetic and neurobiological investigation of chemosensory perception.

Positions: Eminent Professor, Tata Institute of Fundamental Research, Bombay; Director, TIFR National Centre for Biological Sciences, Bangalore; Hony Professor, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore; Senior Associate, National Institute of Advanced Studies, Bangalore; Visiting Fellow/Professor at several universities in USA including at MIT, Cambridge and Caltech.

Learned and Professional Societies: Fellow, The Royal Society, London, Indian Academy of Sciences (Vice-President 1983-86, President 1986-89), Maharashtra Academy of Sciences, Third World Academy of Sciences, and National Academy of Sciences (India); Member, INSA Council (1981-83).

Awards and Honours: UGC National Lecturer (1974); Shanti Swarup Bhatnagar Prize (1976); Golden Jubilee Commemoration Medal (INSA) (1986); Birla Smarak Kosh National Award (1989); Goyal Prize (1991); Aryabhatta Medal (INSA) (1992); Padma Bhushan (1984).

Lectureships: Mendel Centenary Lecture (Indian Science Congress) (1967); Vikram Sarabhai Memorial Lecture (Institution of Engineers, India, Bombay Branch) (1979); Ray- Chowdhary Endowment Lecture (Indian Society for Cell Biology) (1984); Y. Nayudamma Memorial Lecture (1987); S.H. Zaheer Foundation Lecture (Indian Science Congress) (1990); many convocation addresses, learned societys' Lectures in India and elsewhere.

Author/Editor Facet: Contributed a chapter on "Alleles" to 'McGraw -Hill Encyclopaedia on Science'; authored 'Mechanisms of Gene Action and Regulation - The Biological Basis of Medicine' (Academic Press 1968); served as member of editorial boards of: *Mol. Genet.* (1971-90), *J. Biosci.* (1979-84), *Indian J. Exp.*

Biol. (1980-85), and *J. Genet.* (1984-); corresponding editor, *Proc. Roy. Soc., London. (1989-).*

Policy-making Bodies: Member, Panel on Molecular Biology, International Cell Research Organization (Unesco); Science Research Council, UGC (1970-75); Science Advisory Committee to the Union Cabinet (1975-85); Science Research Council, DST (1970- 80); CSIR Governing Body (1986-88); and several other bodies.

Address: Professor, Molecular Biology Unit, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay 400 005; Tel.:215 2971/79; Telex: 011-83009; Code: TIFR IN; Fax: 091-22-2152110.

SIDDIQUIE, Hassan Nasiem

Elected 1983

Born 20 July 1934; Bijnor, Uttar Pradesh
Ph.D. (1985), Aligarh Muslim University

Specialization: Marine Geosciences

Research Achievements: Siddiquie did much work on marine geology and recent sediments of the Arabian Sea and the Bay of Bengal. Prepared the first bottom sediment map of the seas bordering India, which depicts many interesting features of the continental margin and is of much value in planning offshore explorations. He surveyed and estimated the reserves of calcareous sands in the lagoons of Lakshadweep and ilmenite deposits off Ratnagiri; surveyed the sub-marine pipeline routes and the locations of platforms on the Bombay High. As deputy leader, he planned and organized the first Indian expedition to Antarctica and explored polymetallic nodule deposits in the Indian Ocean.

Positions: Director, National Institute of Oceanography, Goa; Senior Geologist, Geological Survey of India.

Learned and Professional Societies: Fellow, Natioanl Academy of Sciences (India) and Geological Society of India; Member, Council of Association of Exploration Geophysicists.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1978); Padma Shri (1983).

Author/Editor Facet: Served on the editorial boards of: *Proc. Indian Acad. Sci.* and *Indian J. Marine Sci.*

Died 14 November 1986.

SIKKA, Satinder Kumar

Elected 1988

Born 22 November 1942; Jhang,Pakistan
Ph.D. (1970), University of Bombay

Specialization: High-Pressure Physics, Band Theory, Neutron Diffraction

Research Achievements: Sikka has established indigenous facilities for doing experimental work in static-pressure and shock-wave fields; used band theory methods to interpret or predict high pressure-phenomena in condensed matter; and solved the phase problem in neutron diffraction.

Positions: Scientific Officer (G) and Head, High Pressure Physics Division, Bhabha Atomic Research Centre, Bombay.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: Material Research Society of India Medal (1991).

Address: Head, High Pressure Physics Division, Bhabha Atomic Research Centre, Bombay 400 085; Tel:(022) 5510979, 5563060 (Ext 3741); Fax: 91-22-5560750; E-mail: sksikka@magnum.barct!ernet.in; Res: 62, Shantiniketan, Anushaktinagar, Bombay 400 085; Tel: (022) 5516773.

SIKKA, Sawan Mal

Elected 1959

Born 1 August 1906; Maghiana, Pakistan
Ph.D. (1939), University of London, UK

Specialization: Botany

Research Achievements: Sikka did much work on cytogenetics and plant breeding. His researches in cytogenetics, interspecific hybridization and induction of mutations in cotton, induction of polyploidy in forage crops and genetics of various traits in wheat and cotton received recognition. He helped to develop a series of NP700 and NP800 rust- resistant high-yielding varieties of wheat.

Positions: Head, Division of Botany, Indian Agricultural Research Institute, New Delhi.

Author/Editor Facet: Co-authored many monographs on cotton; served on editorial boards of: *Indian J. Agri. Sci.* (1959- 66) and *Indian Fmg.* (1960-66).

Policy-making Bodies: Served on some ICAR committees.

Died 8 April 1968.

SIMPSON, Robert Rowell *Elected 1935*

M.Sc.

Specialization: Geology

Research Achievements: Simpson carried out investigations in Jharia coalfields and ruby mines of India.

Positions: Chief Mining Engineer, Court of Wards, Bengal.

Learned and Professional Societies: President, Mining and Geological Institute of India.

Awards and Honours: CIE.

Author/Editor Facet: Wrote two books: 'The Indian Mines Manual' and 'The Coalfields of India'.

SINGH, Baij Nath *Elected 1968*

Born 31 July 1914; Varanasi, Uttar Pradesh
D.Sc. (1947), University of London, UK

Specialization: Protozoology

Research Achievements: Singh did phylogenic classification of amoebae, based on their nuclear division patterns. Found that certain amino acids cause excystment of small, free- living amoebae and that cholesterol feeding renders an avirulent *Entamoeba histolytica* into a virulent form. The method of isolation of eubacteriolytic Myxobacteria has been named 'Singh plate.'

Positions: Senior Scientific Officer, Department of Soil Microbiology, Rothamsted Experimental Station, England; Assistant Director, Deputy Director (Microbiology) and Emeritus Scientist, Central Drug Research Institute, Lucknow.

Learned and Professional Societies: Fellow, National Academy of Sciences (India); Hony Fellow, Indian Society for Protozoology; Member, Indian Society for Microbiology, Parasitology and Protozoology.

Awards and Honours: Silver Plaque (Association of Microbiologists of India) (1979); G.P.Chatterjee Memorial Lecture Award (INSA) (1983).

Author/Editor Facet: Served as editor-in-chief of *Indian J. Parasitol.*, and editor of *Indian J. Microbiol.*

Died 29 December 1985.

SINGH, Baldev

Elected 1967

Born 6 April 1904; Zaffarwal Dutta, Pakistan
M.B.B.S. (1927), Panjab University, Lahore; M.R.C.P. (1930), Royal College of Physicians, London, UK

Specialization: Neurology

Research Achievements: Singh is considered an authority in neurology, neurophysiology and neuropharmacology. He has done electroencephalographic studies on clinical patients and experimental animals. His work unravelled the mechanism of 'sleep humps'.

Positions: Professor Emeritus of Neurology, Professor of Neurology, All India Institute of Medical Science, New Delhi; Consultant (Hony Brigadier), Indian Military Service.

Learned and Professional Societies: Fellow, National Academy of Medical Sciences (India); Hony Fellow, Aeromedical Society of India.

Awards and Honours: Basanti Devi Amirchand Award (ICMR) (1961); Air Marshal Subroto Mukherjee Award; Padma Bhushan (1971).

Lectureships: Sir Nilratan Sircar Oration (1960), National Academy of Medical Science (India) Oration (1965).

Policy-making Bodies: Served on ICMR Scientific Advisory Board and International Brain Research Organization.

Address: Haweli Gainda Singh Wala, P.O. Khanna Nagar, Amritsar 143 001; Tel: (0183) 220873.

SINGH, Balwant

Elected 1992

Born 7 February 1940; Pindi, Pakistan
Ph.D. (1970), University of Bombay

Specialization: Algebraic Geometry and Commutative Algebra

Research Achievements: Singh has described the behaviour of singularities under a blowing-up. Studied differential properties of singularities. Found bounds for a number of automorphisms of curves of high genus in positive characteristic. Classified embeddings of certain curves in terms of their characteristic pairs. Discovered an element-wise characterization for subintegrality and proved a relationship between Picard group and seminormalization.

Positions: Associate Professor, School of Mathematics, Tata Institute of Fundamental Research, Bombay.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Author/Editor Facet: Member, editorial board of 'Contribution to Algebra and Geometry' (*Beitrage Zur Algebra und Geometrie*).

Policy-making Bodies: Secretary, Mathematics Committee (Board of Research for Nuclear Science, DAE) (1986-90); Member and Convenor, NBHM Research Committee, (1992-).

Address: School of Mathematics, Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Bombay 400 005; Tel: (022) 2152971; Fax: 91-22-2152110; Telex: 011-83009 TIFR IN; E-mail: balwants@tifvax.bitnet; Res: 305, Bhaskara, TIFR, Housing Colony, Homi Bhabha Road, Colaba, Bombay 400 005; Tel: (022) 2152718.

SINGH, Bawa Kartar

Foundation Fellow

Born 17 April 1886; Amritsar, Punjab
D.Sc., University of Dublin, Ireland; Sc.D. (1941), University of Cambridge, UK

Specialization: Organic Chemistry

Research Achievements: Singh's major contributions were in stereochemistry. He prepared and resolved several substituted azonium compounds containing an asymmetric nitrogen atom. Worked out a new method for preparing tertiary amines. Studied the optical rotatory power of substituted quaternary azonium compounds in solution. Correlated optical activity with the chemical constitution of organic compounds. Studied the structure and kinetics of mutarotation of stereoisomeric oxymethylene camphors. Attempted to find how the optical rotation of an organic substance could be calculated if its constitution is known. Also did work on condensation products of deoxybenzoin with aromatic aldehydes, determination of sucrose by double viscosity method, and chemical examination of the fruit and kernel of palmyra palm.

Positions: Professor of Chemistry, Government College, Dacca (1910); Head, Department of Chemistry, Government College, Lahore (1918); Professor of Chemistry, Patna College, Indian Educational Service (1921): Ravenshaw College, Cuttack; Head, Department of Chemistry, Science College, Patna (1936); Chemical Adviser, Government of Bihar; Professor of Chemistry (1940), Emeritus Professor (1946), University of Allahabad; Hony Professor and Associate Director, Punjab Institute of Chemistry, Lahore; Hony Professor, Banaras Hindu University (1948-60).

Learned and Professional Societies: Foundation Fellow, Indian Chemical Society (sometime Vice-President and President), Indian Academy of Sciences (Vice-President, 1934- 38), and National Academy of Sciences, India (Foreign Secretary, 1944-46); Additional Vice-President, INSA (1935- 36, 1944-46).

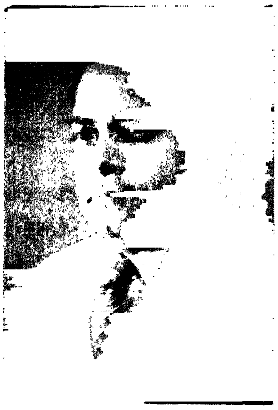
Awards and Honours: President, Chemistry Section, Indian Science Congress (1920).

Author/Editor Facet: Co-authored a book entitled 'Optical Activity and Chemical Constitution'; wrote two chapters to Acharya P.C. Ray's Commemoration Volume.

Died 15 June 1960.

SINGH, Bhola Nath

Elected 1941



Born 22 September 1898; Kuraon, Uttar Pradesh
D.Sc. (1926), Banaras Hindu University, Varanasi

Specialization: Plant Physiology, Agriculture and Agronomy

Research Achievements: Singh did much work on the mechanisms of growth, respiration, assimilation, permeability, transpiration, and metabolism in plants. His fundamental researches produced results of importance in improving agriculture.

Positions: Founder Director, Institute of Agricultural Research, Banaras Hindu University; Agricultural Adviser, Government of India.

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Indian Academy of Sciences, Royal Horticultural Society (London); Member, British Ecological Society, Biochemical Society, (London), Botanical Society of America, American Society of Plant Physiologists, American Society of Agronomy, American Genetic Association, Indian Botanical Society, and Indian Society of Soil Science.

Awards and Honours: Diploma of Honour and Scientific Medal of Merit, (Academia de Sciences, Brazil).

Died (Date N.A.).

SINGH, Digvijai

Elected 1983

Born 11 December 1934; Lucknow, Uttar Pradesh
Ph.D. (1964), University of Wisconsin, USA

Specialization: Mechanical Engineering

Research Achievements: Singh has done extensive work in: fluid film bearings and seals with coupled problems of elastohydrodynamic and piezo-thermo-elastohydrodynamic effects for Newtonian and non-Newtonian lubricants, and for laminar and superlaminar flows; mathematical modelling of pneumatic tyres to predict transient and steady-state interaction between tyre and pavement; and simulation of single-track vehicle motion.

Positions: Director, Central Road Research Institute, New Delhi (1990-); Professor, Head of Mechanical & Industrial Engineering Department, Dean (Academic), Dean (Research & Industrial Liaison), Director (Library), University of Roorkee.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Indian National Academy of Engineering, National Academy of Sciences (India), and Institution of Engineers (India); Member, Indian Society of Mechanical Engineers, Indian Society of Rheology, and Indian Society of Industrial Tribology; Member, Council (1992) and Foreign Secretary (1993-), INSA.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1978); Khosla Research Prizes/Medals (1970,1971,1978,1979,1987, 1990); Institution of Engineers (India) Prizes/Medals (1974- 75,1982); UGC National Lecturership (1982-83).

Author/Editor Facet: Editor, *ISME J. Engng Design* (1982- 85); Member, editorial boards of: *Indian J. Technol.* and *Sadhana.*

Policy-making Bodies: International Coordinator, US-Strategic Highway Research Programme; Corresponding Member, Permanent International Association of Road Congresses, France.

Other Contribution: Singh created a tyre-testing facility at Roorkee, the only one of its kind in country.

Address: Director, Central Road Research Institute, Delhi- Mathura Road, P.O. CRRI, New Delhi 110 020; Tel: (011) 6848917, 6845943; Telex: 031-75369; Fax: 91-11- 6845943; E-mail: crri@sirnetd.ernet.in; Res: Director's Residence, CRRI Colony, Maharani Bagh, New Delhi 110 065; Tel: (011) 6839809.

SINGH, Inderjit

Elected 1952

Born 20 August 1909; Maymo, Burma
Ph.D. (1937), University of Cambridge, UK

Specialization: Physiology

Research Achievements: Singh became Famous for his work on life without breathing, which made it possible to keep dogs alive for 80 min. without breathing. Equally well known were his studies on electrical and mechanical activity of the frog's heart in electrolyte-free solution; tryptaminergic, histaminergic and kinergic fibres in frog vagus nerve; source of acetylcholine, adrenaline and noradrenaline on nervous stimulation of vagus and sympathetic nerve to frog's heart; reactions of depolarized unstriated muscles; and duel contractile system in unstriated muscle.

Positions: Indian Medical Service (1939-44); Professor and Head, Department of Physiology, Dow Medical College, Karachi (1944-48); Professor, Department of Physiology, S.N. Medical College, Agra; ICMR Emeritus Scientist.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Physiological Society of Great Britain; Foundation Fellow, National Academy of Medical Sciences (India); Member, Aeromedical Society.

Awards and Honours: Dutch Fellowship (1960).

Policy-making Bodies: Served on ICMR's governing body.

Other Contributions: Singh also served in the Indian Army; he was in charge of Brigade Laboratory at Allahabad.

Died 5 June 1972.

SINGH, Jamuna Sharan

Elected 1984

Born 26 December 1941; Allahabad, Uttar Pradesh
Ph.D. (1967), Banaras Hindu University, Varanasi

Specialization: Ecology, Ecosystems Analysis, Ecophysiology

Research Achievements: Singh has greatly contributed to our understanding of the development, dynamics and disruption of natural ecosystems. His findings provide a basis for environmental management and conservation, as they shed light on how ecosystems function. He has developed a new method for studying biological resources and for collecting hitherto unavailable data on a variety of ecosystems.

s: Head, Department of Botany (1992-); Professor of Botany (1984-), Banaras Hindu University, Varanasi; Visiting Scientist, Colorado State University, USA (1971-1974; 1981- 82).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), International Society for Tropical Ecology, National Institute of Ecology, Indian Range Management Society, and Central Himalayan Environment Association; Member, INSA Council (1989-91).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1980); Pitamber Pant National Environment Fellowship (Union Ministry of Environment and Forests) (1984); Swami Pranavanand Saraswati Award (1985).

Author/Editor Facet: Served on editorial boards of 7 journals; currently on *J. Bombay Nat. Hist. Soc.* (1993-), *Oecol. Montana* (1991-), *J. Veget. Sci.* (1990-), *Himalayan J. Environ. Zool.* (1990-). He was chief editor, *Tropical Ecology* (1984-90).

Policy-making Bodies: Member, ICSU Special Committee on International Geosphere-Biosphere Programme (1987-90); Advisory Board of Ecological Society for SAARC Countries (1992-), Grassland Biome Working Group for International Biological Programme, P.T. Section of India (1967-91), and several other bodies.

Address: Professor and Head, Department of Botany, Banaras Hindu University, Varanasi 221 005; Tel: (0542) 310290 (Ext 352), 312989; Telex: 545 304 BHU IN; Fax: 91-542- 312059; Res: Old D/4, Jodhpur Colony, BHU Campus, Varanasi 221 005; Tel: (0542) 312593.

SINGH, Lt. Col. Jaswant

Elected 1956

Born 4 December 1901; Gujranwala, Pakistan
M.B., Ch.B., University of Edinburgh; D.T.M.& H., University of London, UK; D.P.H., England

Specialization: Malariology

Research Achievements: Singh made some significant contributions to malaria studies in India, which included malaria survey, laboratory techniques used in malaria diagnosis and control, and chemotherapy of malaria with antimalarials such as atebrin, paludrine, resochin, and camoquin. In conducting a 'screening test' for malaria by using the plasmodial infection of monkeys, Singh opened up a new line of study of chemotherapy with antimalarial drugs. He also did some work on synthetic insecticides.

Positions: Director, Malaria Institute of India (1947) (now National Institute of Communicable Diseases, Delhi).

Learned and Professional Societies: Member, American Society of Tropical Medicine and Hygiene.

Policy-making Bodies: Member, WHO Expert Committee on Malaria.

Other Contributions: As Director of Malaria Eradication Training Centre (WHO) in Kingston, he trained senior professionals; advised the Indonesian government in setting up a Malaria Institute in that country.

Died 13 February 1977.

SINGH, Mahendra Pal

Elected 1986

Born 15 June 1931; Etah, Uttar Pradesh
Ph.D. (1962), University of Maryland, USA

Specialization: Applied Mathematics (Modelling in Biofluid Dynamics and Atmospheric Dispersion), Environmental Risk Assessment

Research Achievements: In biofluid dynamics, Singh initiated a study on entry flow in a curved pipe relevant to problems in atherosclerosis. Started work on transport of gases like O_2, CO_2 and CO in pulmonary and systemic circulations, and on nocturnal dispersion of pollutants. Regulatory agencies the world over have been using so far day-time dispersion formulations for nocturnal dispersion of pollutants.

Positions: Professor of Mathematics (1968-); Head of Department (1969-72, 1976-77), Head of Division of Biosciences (1976-77); Head, Centre for Atmospheric Science, (1979-89), all at Indian Institute of Technology, Delhi; Visiting Professor, University of Alabama, Huntsville, USA (1990); Visiting Professor, University of Cambridge (1973).

Learned and Professional Societies: Fellow, National Academy of Sciences, India (President, Physical Sciences Section 1976-77); President, Indian Mathematical Society.

Awards and Honours: Y.S. Parmar Gold Medal and Oration Award (1984); President (Mathematics, Section), Indian Science Congress Association (1985-86); UGC National Lecturer (1976- 77).

Lectureships: Taylor Memorial Lecture (Indian Society of Theoretical and Applied Mechanics) (1986); Platinum Jubilee Lecture (Indian Science Congress) (1989).

Author/Editor Facet: Member, editorial boards of six journals.

Policy-making Bodies: Member, ICSU International Committee for the International Decade for Natural Disaster Reduction (1990-).

Other Contributions: Member, Indian delegation to Indo-US STI Programme on Monsoon Meteorology (1983); Member, Indian delegation to the Indo-US Subcommission set up by the governments of India and USA (1985, 1987).

Address: Professor, Centre for Atmospheric Sciences, IIT Delhi, Hauz Khas, New Delhi 110 016; Tel: (011) 651842; Fax: 91-11-8662037; Res: 10, West Avenue, IIT Campus, New Delhi 110 016 Tel: (011) 669120.

SINGH, Nirmal Tej

Elected 1988

Born 31 December 1933; Layallpur, Pakistan
Ph.D. (1967), University of California, USA

Specialization: Soil Science

Research Achievements: Singh's researches on water requirement during reclamation, the role of organic matter in the removal of sodium from soils, role of evaporative demand on salt accumulation near roots and comparative role of transport processes and nutrient availability have wider applications in amelioration of salt-affected soils and in making the most efficient use of applied irrigation water and nutrients. His other research contributions are concerned with nutrient-water interaction, saline irrigation, improving nutrient efficiency and green manuring. He has prepared a water quality map of ground waters and elucidated the nature of salts in degraded soils of Punjab. Also described and mapped the soils of Andaman & Nicobar Islands.

Positions: Director, Central Soil Salinity Research Institute, Karnal; Director, Central Agricultural Research Institute, Port Blair; Professor of Soils/Senior Soil Physicist, Head, Department of Soils, Punjab Agricultural University, Ludhiana.

Learned and Professional Societies: Fellow, National Academy of Agricultural Sciences (India) and Indian Society of Soil Science.

Awards and Honours: Rafi Ahmed Kidwai Memorial Prize (1980- 81); Fakhrudin Ali Ahmed Award (1986-87).

Lectureships: Mukerjee Memorial Lecture (Indian Society of Soil Science) (1989).

Author/Editor Facet: Served as chief editor of *J. Andaman Sci. Assoc.*; edited a number of books and contributed chapters to many books.

Policy-making Bodies: Chairman, Steering Committee of UNDP Project on Irrigation Management; Member, Haryana State Council of Science and Technology, Haryana State Board of Prevention and Control of Water Pollution, Science & Technology Council of Haryana, and of several other bodies.

Other Contributions: Established the Andaman Science Association of which he was Founder President; instrumental in creating Chapters of Indian Society of Soil Science.

Address: Director, Central Soil Salinity Research Institute, Karnal 132 001, Haryana; Tel: (0184) 20801; Telex: 0396- 218 SSRI IN; Fax: 91-184-20480; Res: Type VI, Kothi No. 3, CSSRI Campus, Karnal 132 001; Tel: (0184) 21801.

SINGH, Pawan Kumar

Elected 1990

Born 31 July 1945; Varanasi, Uttar Pradesh
Ph.D. (1988), Banaras Hindu University, Varanasi

Specialization: Plant Sciences (Algology, Biological Nitrogen Fixation, Biofertilizers)

Research Achievements: Working on basic and applied aspects of free-living and symbiotic cyanobacteria and cyanophages, Singh has made contributions to our understanding of their biology and role in nature, particularly in rice fields. He studied in detail *Azolla*- cyanobacterium association and introduced its applicability in Indian agriculture as biofertilizer and feed. Also made investigations on agricultural chemicals/pollutants- cyanobacteria interactions and integrated nutrient management for sustainable agriculture.

Positions: Principal Scientist, Indian Institute of Sugarcane Research, Lucknow; Principal Scientist, Head of Division, Joint Director and Director, Central Rice Research Institute, Cuttack.

Learned and Professional Societies: Fellow, National Academy of Agricultural Sciences(India).

Awards and Honours: ICAR National Fellow (1980); Hari Om Ashram Trust Award (ICAR); (1981).

Policy-making Bodies: Member, Upland Rice Research Consortium Steering Committee, International Rice Research Institute, Manila.

Address: Principal Scientist, Indian Institute of Sugarcane Research, Lucknow 226 002; Tel: 52572, 54674; Telex: 535- 309; Res: Quarter No. V/2, Ikshpuri Colony, Jail Road, Lucknow 226 002.

SINGH, Rangil

Elected 1992

Born 25 December 1935; Seri, Jammu & Kashmir
Ph.D. (1968), Punjab Agricultural University, Ludhiana

Specialization: Plant Biochemistry (Carbohydrate Metabolism in Higher Plants)

Research Achievements: Singh has investigated bioregulation of sucrose import and transformation to starch and protein during grain/seed filling in cereals and pulses. Also studied the role of metabolites, metal ions and biomodulators on *in vivo* cooperative role of enzymes involved in sucrose metabolism in these crop plants. Formulated pathways for the regulation of sucrose biosynthesis and storage in storage cells of sugarcane. Also formulated pathways for galactomannan biosynthesis and remobilization in *guar* seed.

Positions: Chairman, Department of Biochemistry, Punjab Agricultural University, Ludhiana (1989-); Visiting Scientist, McGill University, Montreal, Canada.

Awards and Honours: Nestle's Food Scientists Award (Association of Food Scientists & Technologists, India) (1992).

Author/Editor Facet: Contributed two chapters to book 'Recent Advances in Plant Biochemistry' (1989) and contributor/editor of 'Plant Biochemical Research in India' (1990).

Address: Senior Biochemist, Department of Biochemistry, Punjab Agricultural University, Ludhiana 141 004; Tel: (0161) 51972 (Ext 322); Res: 9/16, PAU Campus, Ludhiana 141 004.

SINGH, Rishi Narain

Elected 1991

Born 17 July 1943; Bajha,Uttar Pradesh
Ph.D. (1969), Banaras Hindu University, Varanasi

Specialization: Theoretical Tectonophysics, Marine Geophysics, Groundwater Flow Theory

Research Achievements: Singh's research aims at quantification of geological and geophysical processes in tectonophysics, marine geophysics and groundwater flow. These include the determination of thermal structure/ evolution and the rheological structure of the Indian continental lithosphere, a model of evolution of Cuddapah sedimentary basin, modelling of the movement of lithosphere/ asthenosphere boundary, estimation of stress state of some parts of the Indian continental lithosphere due to surface and internal loads, inversion methodologies for heat flow and geomagnetic data interpretation, generation and propagation of hydromagnetic waves in the liquid core, isostatic compensation mechanism of several Indian oceanic bathymetric features, and structure of the Bay of Bengal, to list a few.

Positions: Scientist F, National Geophysical Research Institute, Hyderabad; Associate Professor, Indian Institute of Geomagnetism, Bombay (1978).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Indian Geophysical Union, and Association of Exploration Geophysicists (India).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1985) UGC National Lecturer (1986-87).

Author/Editor Facet: Member, editorial board, *Proc. Indian Acad. Sci. (Earth Planet. Sci.).*

Policy-making Bodies: Member, Commission on Geodynamics and Tectonophysics (1988-91).

Address: Scientist, National Geophysical Research Institute, Hyderabad 500 007; Tel: (0842) 850141, 851708 (Ext 282); Telex: 0425-7018; Fax: 91-842-854164; Res: 4-53/2, Street No. 8/3, Habshiguda, Hyderabad 500 007; Tel: (0842) 850570 .

SINGH, Rudra Pal

Elected 1980

Born 27 September 1919; Goraiya, Uttar Pradesh
Ph.D. (1955), Washington State University, USA

Specialization: Theory of Solids and Statistical Physics

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India);Member, Seismological Society of America (1975-80) and American Geophysical Union (1973-74); Life Member, Indian Mathematical Society, Indian Society of Earthquake Technology, and *Vigyan Parishad.*

Awards and Honours: UGC National Associate (1975-80); UGC National Fellow (1984-86).

Author/Editor Facet: Co-authored 'Seismic Waves and Sources' (Springer-Verlag, 1981), a monograph which has won worldwide acclaim, and 'Deformation of Elastic Solids' (Prentice-Hall, 1991).

Policy-making Bodies: Chairman, Indian National Committee for IUGG (1991-94).

Address: Professor, Department of Mathematics, Maharshi Dayanand University, Rohtak 124 001; Tel: (01262) 76649; Res: UH-3, Medical Enclave, Rohtak 124 001; Tel: (01262) 78794.

SINGH, Satya Narain

Elected 1963

Born 31 August 1911, Sangareddy, Andhra Pradesh
D.Sc. (1965), University of London, UK

Specialization: Zoology, Helminthology

Research Achievements: Singh specialized in helminthology to which he made notable contributions. His research covered nematode trematode and helminth parasites as well as marine zoology. Described many genera of nematode parasites of birds, such as *Buckleyfilaria* and *Lerouxinema* and a large number of species new to science.

Positions: Professor and Head, Department of Zoology, Osmania University, Hyderabad; Founder Director, Ross Research Institute.

Learned and Professional Societies: Fellow, Zoological Society of India (sometime Vice-President) and Helminthological Society of India (President 1963, 1969-73).

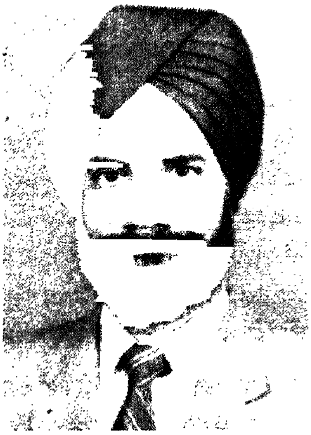
Award and Honours: Dr. Bhalerao Memorial Gold Medal (1969); Sir Dorab Tata Gold Medal (1968).

Other Contributions: Founded the Ross Research Institute, named after Sir Ronald Ross.

Died 8 April 1982.

SINGH, Surjit

Elected 1988



Born 12 June 1940;Jhelum, Pakistan
Ph.D. (1967), Indian Institute of Technology, Kanpur

Specialization: Physical Chemistry, Vibrational Spectroscopy and Molecular Interactions

Research Achievements: Singh has done extensive work on theoretical and experimental aspects of vibrational spectroscopic studies on molecular interactions and force fields including such areas as matrix isolation, vibrational relaxation, *ab initio* molecular orbital calculations, absorption and solvation, polar tensors and dipole functions.

Positions: Professor and Head, Regional Sophisticated Instrumentation Centre; Dean, Academic (Courses), Indian Institute of Technology, Madras; AVH Fellow; Visiting Professor (DFG) at Uni-Siegen, Germany.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Author/Editor Facet: Member, editorial board, *Proc. Indian Acad. Sci.*

Policy-making Bodies: Member, Board of Governors, Pondicherry Engineering College; Chairman, Management Committee, KVIIT, Madras.

Address: Professor, Department of Chemistry (RSIC), Indian Institute of Technology, Madras 600 036; Tel: (044) 2351365 (Ext 3154); Telex: 041-8926; Fax: 91-44- 2350509; E-mail: sangam!iitm!rsic; Res: B 24, III Cross Road, IIT, Madras 600 036; Tel: (044) 2350346.

SINGH, Virendra

Elected 1975

Born 8 June 1938, Bijnore, Uttar Pradesh
Ph.D. (1962), University of California, Berkeley, USA

Specialization: Theoretical Physics, High-Energy Physics, Foundations of Quantum Mechanics

Research Achievements: Singh has received international peer recognition for his contributions to the theory of elementary particles. His contributions extend from theoretical high energy physics to the deepest conceptual problems in the foundations of quantum mechanics. In theoretical high-energy physics, some of Singh's well-known contributions relate to Coulomb scattering amplitude analyticity, analysis of high-energy pion-nucleon scattering, Reggisation of elementary particles in field theory, coupling constant sum rule in Unitary Symmetry, Beg-Singh SU(6) mass formula, discovery of fixed poles in current algebra amplitudes, Singh-Pais theorems on low-energy Compton scattering, Singh-Roy bounds on high-energy scattering amplitudes and charge exchange cross-sections. His work in potential theory on Sextic oscillator triggered a large number of investigations. He extended Bell's seminal work on hidden variable theories in directions involving essentially newer tests for two-particle correlation experiments to multiparticle systems and to stochastic noncontextual theories. Formulated a new concept for Signal Locality.

Postions: Director and Professor of Eminence, Tata Institute of Fundamental Research, Bombay; Hony Professor, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore; Visiting Full Professor (1971-72), Visiting Associate Professor, Rockefeller University, New York (1966-67); Member, Institute for Advanced Study, Princeton, USA (1963- 64).

Learned and Professional Societies: Fellow, Indian Academy of Sciences (Council Member, 1977-82) and National Academy of Sciences (India); President, Indian Physics Association (1985- 86).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1973); Meghnad Saha Award (1979).

Author/Editor Facet: Edited/co-edited 10 books (vols) including 3 vols on 'Advances in High Energy Physics'; member of editorial boards of *Indian J. Pure Appl. Phys., Indian J. Pure Appl. Maths., Pramana, Comment Nucl. Particle Phys.* and other journals.

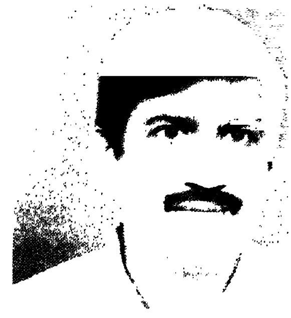
Policy-making Bodies: Member, IUPAP Commission on Particles and Fields (1987-93); Council Member, Indian Statistical Institute (1986-88) and Saha Institute of Nuclear Physics; Chairman, Board of Research in Nuclear Science (DAE) (1986); and many other bodies.

Address: Director, Tata Institute of Fundamental Research, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152680/2152971; Telex: 011-83009 Code: TIFR IN; Fax: 91- 22-2152110; E-mail: vsingh@tifrvax.bitnet; Res: 1010, Bhaskara, TIFR Housing Colony, Homi Bhabha Road, Colaba, Bombay 400 005; Tel: (022) 2152269.

SINGHI, Navin Kumar Madhavprasad *Elected 1989*

Born 19 March 1949; Indore, Madhya Pradesh
Ph.D.(1973), University of Bombay

Specialization: Mathematics, Combinatorics



Research Achievements: Singhi's research interests include designs, finite geometries, graph theory enumeration problems, and applications to statistics and coding theory. His work on the embedding of quasi-residual designs (with Shrikhande) is a landmark and its subsequent generalization with Bose, which led to strongly regular multigraphs has proved to be extremely useful in various problems of embedding, and has been included in most of the recent books on designs. He gave a complete classification of (19.9,4) designs and asymptotic lower bounds on nonequivalent Hadamard matrices. This has had a great influence on the study of similar problems. Proved (with Shrikhande) the well known γ-design conjecture of Ryser for all prime numbers λ, which infact is the only infinite family for which the conjecture has been proved. Generalization (with Deza and Erdos) of a well- known theorem of Deza on weak and strong δ systems has led to many other interesting generalizations. His work (with D.K. Raychaudhuri) on the uniqueness of certain designs coming from projective spaces extends the classical fundamental coordinatization theorem of Hilbert, Veblen and Young.

Positions: Associate Professor, School of Mathematics, Tata Institute of Fundamental Research, Bombay.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, and Maharashtra Academy of Sciences.

Awards and Honours: INSA Medal for Young Scientists (1977).

Author/Editor Facets: Member, editorial board, *J. Stat. Plann. Infer.* and *European J. Combinat.*

Address: Associate Professor, School of Mathematics, Tata Institute of Fundamental Research, Colaba, Bombay 400 005; Tel: (022) 2152971; E-mail: singhi@tifrvax.bitnet; Res: 908, Bhaskara, TIFR Housing Colony, Colaba, Bombay 400 005; Tel: (022) 2151814.

SINGWI, Kundan Singh

Elected 1962

Born 13 March 1919, Udaipur, Rajasthan
D.Sc. (1949), University of Allahabad

Specialization: Solid State Physics

Research Achievements: Singwi started his research in quantum statistics and applied the result to studies of equilibrium abundance of isotopes, white dwarf stars, diamagnetism of relativistic free electron as and viscosity and thermal conductivity of ^{3}He - e mixtures. Proposed a statistical model for multiple particle production in nucleon-nucleon collisions. Developed a strong group in reactor physics and neutron physics at Atomic Energy Establishment (now BARC), Bombay, and investigated the scattering of thermal neutrons from solids, using the methods of second quantization. Worked on the relation between measurable neutron scattering spectra and the microscopic atomic motion in liquids. Developed the concept of 'static local field' in order to take into account the Pauli and Coulomb hole surrounding each electron (STLS theory). The STLS theory predicted the existence of a condensed electron- hole liquid phase in highly strained Ge and Si.

Positions: Professor, Department of Physics, North Western University, USA; Head, Physics Department, University of Allahabad; and Head, Theoretical Physics and Applied Mathematics Division, Atomic Energy Establishment (now BARC), Bombay.

Learned and Professional Societies: Fellow, American Physical Society.

Author/Editor Facet: Member, editorial board, *Phys. Lett.*

Died 18 October 1990.

SINHA, Akhoury Purnendu Bhusan

Elected 1978

Born 27 December 1928; Buxar, Bihar
Ph.D. (1954), University of London, UK

Specialization: Solid-State Chemistry

Research Achievements: Sinha has synthesized novel transition metal compounds, studied electron-lattice interactions leading to crystal distortion and metal-insulator transitions; electron transport in low-mobility semiconductors; switching and memory effects and magnetic ordering. He developed useful solid-state products, e.g. thermistors, photocells, magnets and photovoltaic materials.

Positions: Scientist(Director's grade) and Head, Physical Chemistry Division, National Chemical Laboratory, Pune (Retd).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences, India, and Maharashtra Academy of Sciences.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1972); NRDC Award (1978).

Author/Editor Facet: Member, editorial board, *Bull. Mater. Sci.* and *Indian J. Pure Appl. Phys.*

Address: 1, Vrindavan Society, Pune 411 008; Tel; (0212) 369905.

SINHA, Awadh Kishore Prasad *Elected 1966*

Born 6 June 1918;Tekanpura, Bihar
Ph.D. (1951), University of Michigan, USA

Specialization: Psychology

Research Achievements: Sinha received recognition for his outstanding research on social distance, stereotypes, prestige suggestion, and prejudice in the sub-field of social psychology; and on experimental induction of anxiety, intersensory transfer in learning sequence and transfer as a function of method of first-task learning in experimental psychology. His works are cited in books and journals.

Positions: Dean, Faculty of Social Sciences (1978-80) Professor and Head, Department of Psychology, Ravi Shankar University, Raipur (1977-80); Senior Professor and Head, Department of Psychology (1976-77), Director, Centre for Research in Humanities, University of Rajasthan, Jaipur (1976-77); Chief Psychologist and Director (Grade I), Directorate of Psychological Research, R & D Organization, Ministry of Defence (1968-76); Director and Senior Professor of Psychology, Institute of Psychological Research and Service, Patna University, Patna (1959-68).

Learned and Professional Societies: Fellow, International Council of Psychologists (1963); President, Indian Psychological Association (1961-67) and Indian Psychometric and Educational Research Association (1969); Member, American Psychological Association.

Awards and Honours: S.P. Psychology National Award (1983); S.P. Psychology Best Book Award (1990); President, Psychology and Educational Sciences Section, Indian Science Congress (1957-58).

Lectureships: Jamuna Prasad Memorial Lecture (1982); First S.P. Eastern-Western Psychology Lecture Award (1982); Platinum Jubilee Lecture (Indian Science Congress) (1989).

Author/Editor Facet: Authored two books and edited three; editor, *Indian J. Psychol.*; chief editor, *Indian J. Psychomet. Educ.*

Policy-making Bodies: Member, Executive Committee, International Round Table for the Advancement of Counselling (1972); Member, All-India Educational and Vocational Guidance Association (President, 1981).

Other Contributions: Sinha has rendered assistance to both public and private sector organizations in their training programmes and human resources development.

Address: Road No. 3, Rajendra Nagar, Patna 800 016; Tel: (0612) 651177.

SINHA, Bikash C.

Elected 1989

Born 16 June 1945; Calcutta, West Bengal
D.Sc. (1981), University of London, UK

Specialization: High-Energy Physics, Quark-Gluon Plasma, Early Universe Cosmology

Research Achievements: Sinha has done pioneering work on single particle and heavy ion optical potential. Calculated, for the first time, the response of the nucleus to the single particle field of the projectile nucleus. His work in the field of quark- gluon plasma is recognized internationally. In particular, Sinha's works on the photons and dileptons as signals, boost non- invariant hydrodynamic flow, and very early universe quark-hadron phase transition, to name a few, are rated as vey important contributions. His work has led to a set of experiments at CERN, SPS the purpose of which is to look for photons as possible signals of quark-gluon plasma.

Positions: Director, Variable Energy Cyclotron Centre, Calcutta; Director, Saha Institute of Nuclear Physics, Calcutta.

Learned and Professional Societies: Life Member, Indian Physics Association, Indian Vacuum Society, and International Society for Radiation Physics (Vice-President).

Author/Editor Facet: Edited proceedings of seven conferences mostly relating to nuclear physics and allied areas; editor, *Phys. News* (1981-85).

Policy-making Bodies: Member, International Advisory Committee on Quark Matter (1988-91); International Advisory Committee on Nucleus-Nucleus Collision; Programme Advisory Committee; Chairman, Programme and Planning Committee in Nuclear Physics, DST; Steering Committee, Centre for Advanced Technology and Variable Energy Cyclotron Centre, BARC Steering committee, etc.

Other Contributions: Sinha has contributed greatly to R & D associated with the natural helium gas emanating from thermal springs at Bakreswar and Tantloi and made a viable research centre at Bakreswar; responsible for experimental collaboration programmes with CERN on high-energy nuclear collision; initiated the superconducting cyclotron project at Calcutta.

Address: Director, Variable Energy Cyclotron Centre, DAE 1/AF, Bidhan Nagar, Calcutta 700 064; Tel: 37-0032 (off), 752206 (Res); Fax: 91-33-346871; Telex: CA 4526; E-mail: guest@veccal.ernet.in.

SINHA, Krityunjai Prasad

Elected 1979

Born 5 July 1929; Akhtiarpore, Bihar
Ph.D. (1956), University of Poona; Ph.D. (1959), University of Bristol, UK

Specialization: Solid State Physics, Theoretical Physics, Complex System

Research Achievements: Sinha's researches deal with quantum theory of solid-solid interaction, discovery of cooperative Jahn- Teller induced phase transition, and mechanisms of various types of interactions in magnetically ordered solids. He suggested a novel electronic mechanism (involving lochons local charged bosons) for high-temperature superconductors; predicted photoinduced superconductivity, which was recently confirmed in cuprates. Sinha's other areas of research relate to: development of superstrong gravity at extreme density, phase transition in the early universe, and non- singular cosmological models.

Positions: Director, Institute of Research on Complex Systems, North Eastern Hill University, Shillong (1991-93); Senior Professor, Departments of Physics and Mathematics and Centre for Theoretical Studies; Chairman, Mathematics; Chairman, Division of Physics and Mathematics; Chairman, Centre for Theoretical Studies; MSIL Professor; INSA Senior Scientist (1990-93), all at Indian Institute of Science, Bangalore; Senior Scientist, Bell Laboratories, NJ, USA (1968-70); Visiting Professor, International Centre for Theoretical Physics, Trieste; H.H. Wills Laboratory, Bristol, and Cavendish Laboratory, Cambridge (1977- 78); University of Grenoble (1983-84); Goteberg, Sweden (1986); University of Western Ontario, London, Canada (1987-88).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), American Physical Society, New York Academy of Sciences, and Academy of Commonwealth; Hony Member, International Centre for Theoretical Physics, Indian Cryogenic Council (President 1990-93), and International Society of General Relativity and Gravitation.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1974); Distinguished Alumni, (H.H. Wills Physics Laboratory, Bristol) (1977); IISc Platinum Jubilee Distinguished Alumni Award (1984); UGC National Lectureship (1972-73).

Lectureships: Lectures at ICTP, Trieste (1972, 1976, 1983).

Author/Editor/Facet: Authored/co-authored 6 books, which include 'Interaction in Magnetically Ordered Solids' (Oxford, 1980), 'Magnetic Superconductors' (Nova, 1989), and 'High Temperature Superconductivity' (Nova, 1993); edited one book; member of editorial boards of many journals including *Int. J. Energy.*

Policy-making Bodies: Member, Advisory Council of Treshold Foundation & Award (London, 1978); Consultant Programme Committee on Magnetism and Magnetic Materials (USA, 1974).

Other Contributions: Established schools in condensed matter, theoretical studies and complex systems at many institutions.

Address: 48/6, 8th Main, 13th Cross, Malleswaram, Bangalore 560 003; Tel: (080) 345553.

SINHA, Mriganka Sekhar *Elected 1960*

Born 12 October 1915; Burdwan,West Bengal
D.Sc. (1946), University of Calcutta

Specialization: High Energy and Cosmic-Ray Physics

Research Achievements: Sinha measured the mean-life of muons in elements of increasing Z-values; investigated the interaction of muons with matter with self-operating cloud- chambers constructed for the first time in India; determined the momentum-spectrum and charge-ratio of muons with a magnetic cosmic ray spectrograph; also carried out simultaneous estimation of their specific ionization in helium and argon in a cloud-chamber.

Positions: Senior Professor of Physics, Regionl Engineering College, Durgapur; Dean, Faculty of Engineering, University of Burdwan.

Lectureships: J.C. Bose Memorial Lecture (1965); D.M. Bose Memorial Lecture (1986).

Address: Sputnik, P-39, Recol Park, Durgapur, West Bengal.

SINHA, Suresh Kumar

Elected 1983

Born 18 July 1934; Bulandshahr, Uttar Pradesh
Ph.D. (1962), Agra University; Ph.D. (1964), University of Alberta, Canada; D.Sc. *(h.c.),* Pantnagar University

Specialization : Plant Physiology and Biochemistry.

Research Achievements: Sinha has studied: (i) Glycine-serine interconversion and splitting of glycine to provide C_2 of glycine which can become C_3 of serine; (ii) Cynogenic glucosides as determinants of the quality of Cassava (Tapioca), and mechanism of tuberization in Cassava; (iii) Change from C_4 to C_3 photosynthesis in Sorghum after anthesis; (iv) Physiological, biochemical and genetic basis of heterosis; (v) Causes of poor yield in Pulses and remedial measures; (vi) Physiological mechanism of drought tolerance in crops - balance between productivity and stability; (vii) Drought induced senescence; (viii) Physiological basis of irrigation; and (ix) Remote sensing for assessing crop condition.

Positions: Director (1991-), Professor of Eminence (1978- 91), Indian Agricultural Research Institute, New Delhi; Alf Hannaford Fellow, Waite Agricultural Research Institute, University of Adelaide, Australia (1976-77).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), National Academy of Agricultural Sciences (India).

Awards and Honours: J.J. Chinoy Gold Medal (Indian Society for Plant Physiology) (1979); FICCI Award (1983); S.M. Sircar Memorial Award (Bengal Botanical Society) (1984); VASVIK Award (1985); Om Prakash Bhasin Award (1988); Birbal Sahni Medal (Indian Botanical Society) (1989); FIE Foundation Award (1992); Jawaharlal Nehru Birth Centenary Lecture Award (INSA) (1993); Sunder Lal Hora Medal (INSA) (1993).

Author/Editor Facet: Member, editorial boards of: *Indian J. Agri. Sci., Field Crop Res., Climate Change, Indian J. Exp. Biol., J. Sci. Technol.,* and *J. Agri. Sci.*

Policy-making Bodies: Member, Advisory Committee on Physiology and Biochemistry of drought resistance in Plants, IDRC (Canada), Scientific Panel on Physiology and Biochemistry (ICAR), Research Council (IARI), Research Advisory Council of CIMAP and NBRI, Lucknow, Man and Biosphere Committee, Department of Environment, Government of India, Scientific Committee of International Geosphere Biosphere Programme and of various scientific committees of CSIR, DST, UGC and ICAR, IITM, Pune etc.; Chairman, Scientific Advisory Committee, G.B. Pant Himalayan Institute of Environment and Development; Co-Chairman, Agriculture and Forestry Section, IPCC Working Group II (WMO).

Address: Director, Indian Agricultural Research Institute, New Delhi 110012; Tel: (011) 5754595, 5788682 (Lab.); Res: B-8, IARI, New Delhi 110 012; Tel: (011) 5754599.

SINHA, Vishwa Raman Prasad

Elected 1992

Born 1 October 1938; Hajipur, Bihar
Ph.D. (1965), University of Liverpool, UK

Specialization: Fisheries Ecology, Aquaculture, Fish Reproduction

Research Achievements: Sinha has made contributions to various aspects of the biology of eel, which are recognized all over the world. He was the first to identify the sex of eels and thus to clarify the controversies of sex-change theory in eel. Made a breakthrough in the fractionation of fish pituitary extract for isolating the hormone gonadotropin. He showed through composite fish culture, how small holders can raise carp production in ponds from very small amounts to 3-10 tonnes/ha/year.

Positions: FAO/UNDP, Senior Specialist, Fisheries Research Institute, Mymensingh, Bangladesh (1992-); Visiting Professor, International Rice Research Institute, Manila; Director, Central Institute of Fisheries Education (1988-92);

FAO/UNDP Senior Aquaculturist, Bangkok, Thailand, (1986-88); National Project Director, FAO/UNDP Projects (1978-86); Project Coordinator, All India Coordinated Project on Fish Culture and Seed Production (1971-78).

Learned and Professional Societies: Fellow, Zoological Society (London); National Academy of Sciences (India); Vice- President, Indian Society of Coastal Agricultural Research; Founder Member, Asian Fisheries Society, Manila; President, Indian Fisheries Association.

Awards and Honours: Hooker Award (1975); Rafi Ahmed Kidwai Memorial Prize (ICAR) (1976); ICAR Team Leadership Award (1978); Lal Bahadur Shastri Award (1989).

Author/Editor Facet: Authored seven books; served on two editorial boards.

Policy-making Bodies: CGIAR/TAC Consultant for reviewing the research related activities of the International Centres for Living Aquatic Resource Management, Manila (1989); CGIAR/TAC Consultant on the role of CGIAR in International Fisheries Research (1990); Member, Indian National Committee for Inter- Union Commission on the Application of Science to Agriculture, Forestry and Aquaculture (CASAFA); Consultant to the World Bank, FAO/UNDP, WFP projects in India, Bangladesh, Burma and North Korea.

Other Contributions: Established the Central Institute of Freshwater Aquaculture, Krishi Vigyan Kendra and Trainer's Training Centre near Bhubaneshwar. Also upgraded the Central Institute of Fisheries Education, Bombay to the status of a university.

Address: FAO/UNDP Senior Specialist, Fisheries Research Management and Development, C/o FAOR Office in Bangladesh, P.O. Box 5039 (New Market), Dhaka, Bangladesh.

SINTON, Brig. John Alexander *Foundation Fellow*

Born 2 December 1884; Victoria, British Columbia
M.B., B.Ch., B.A.O., Royal University, Ireland; D.P.H. (1960), University of Cambridge, UK; D.T.M., University of Liverpool, UK; M.D. *(h.c.)*, Queen's University

Specialization: Medical Science

Research Achievements: Sinton was well known in the field of malarial and entomological research. His researches with collaborators added greatly to our knowledge of newer antimalarials. His work on plasmodial infections of monkeys was of a pioneering nature. He was also well known for his contributions to tropical medicine. Sinton's 'Malaria Map of India' is considered unique for any tropical country.

Positions: Riddell Demonstrator in Pathology, Queen's University; War Service; Director, Malaria Survey of India.

Learned and Professional Societies: Fellow, Royal Society of London.

Awards and Honours: OBE (1919); Chalmers Memorial Medal (Royal Society of Tropical Medicine and Hygiene) (1928); Bisselt-Hawkins Medal (Royal College of Physicians, London) (1944); Robert Campbell Memorial Oration and Medal (Ulster Medical Society) (1946), Mary Kingsley Medal (Liverpool School of Tropical Medicine) (1949); Hony Brigadier.

Other Contributions: Apart from scholarly publishing, Sinton was a good exponent of technical prose which would interest the uninitiated. One of his general papers, titled 'What Malaria Costs India', attained the status of a catchphrase in 1950s. So did 'Man-Made Malaria'.

Died 25 March 1956.

SIRCAR, A.C. *Elected 1937*

SIRCAR, Sourindra Mohan *Elected 1954*

Born 1 March 1908; Paikpara, Bangladesh
Ph.D. (1934), University of London, UK

Specialization: Botany, Plant Physiology

Research Achievements: Sircar worked extensively on vernalization and photoperiodism. His studies showed that induction of early flowering of rice by the application of short-day treatment to seedlings for varying periods could be achieved, and that the photoperiodic effect of short days is of a quantitative nature as the degree of earliness for flowering increases with the duration of treatment. His findings on the nutrition of the rice plant was the basis of the fertilizer requirements of the *indica* varieties. He established that the photosynthetic efficiency of rice is secondary in importance to the translocation of photosynthates from leaf and stem to the ripening grains, in so far as grain yield is concerned. Using radioactivity assay technique, he demonstrated that the local tall varieties are not photosynthetically less efficient; rather some of them are more efficient than the short *japonica* varieties but deficiency in transport to the grains is the cause of the relatively low yield.

Positions: Reader and Sir Rashbehary Ghose Professor of Botany, University of Calcutta; Director, Bose Institute; Emeritus Scientist, Indian Council of Agricultural Research.

Learned and Professional Societies: Fellow, German Academy of Natural Sciences, Asiatic Society, Botanical Society of Bengal, Indian Society of Plant Physiology, Indian Photobiological Society, Plant Biochemical Society (sometime President); General Secretary (1972-75), Vice-President, International Botanical Congress Association (1975); Member, INSA Council (1965-66).

Awards and Honours: President, Botany Section (1963), General President, Indian Science Congress (1977-78); Paul Johannes Brühl Memorial Medal (Asiatic Society); Rafi Ahmed Kidwai Memorial Prize (1968-70); Birbal Sahni Gold Medal (Indian Botanical Society) (1970).

Author/Editor Facet: Sircar authored 'Plant Hormone Research in India' (ICAR, 1971).

Died 21 February 1978.

SIRKAR, Sukumar Chandra

Elected 1942

Born 19 April 1898; Kullya, Bangladesh
D.Sc. (1933), University of Calcutta

Specialization: Spectroscopy, X-Rays and Crystal Structure

Research Achievements: Sirkar carried out extensive work on Raman effect, X-rays and crystal structure, Kerr's effect, electric moment of molecules, and cosmic rays. He did some experiments on the origin of extra Laue spots in the vicinity of Bragg reflection from crystals. Showed that experimental data were more in accord with the theory put forward by Zachariasen than that by Raman. He did some work of significance on ultraviolet absorption spectra of conjugated aromatic molecules in gaseous, liquid and solid phases as well as when dispersed in rigid matrices at low temperatures.

Positions: Reader in Physics, Indian Association for the Cultivation of Science (IACS), Calcutta (1943); Radiologist, Inspectorate of Ammunition, Kirkee (1944); Lecturer in Physics, University of Calcutta (1945-47); Professor and Head (1947-52), Mahendra Lal Sircar Professor of Physics (1953- 63), Department of Optics, IACS, Calcutta.

Learned and Professional Societies: President, Indian Association for the Cultivation of Science (1944); Member, Indian Physical Society (sometime President).

Awards and Honours: Griffith Memorial Prize (1934); Sir Asutosh Mookerjee Gold Medal (Indian Physical Society) (1935).

Author/Editor Facet: An active member of the editorial board of *Sci. & Cult.*

Died 15 February 1983.

SIVARAMAN, Churya

Elected 1986

Born 2 December 1923; Palghat, Kerala
Ph.D. (1950), University of Madras

Specialization: Biochemistry

Research Achievements: Sivaraman's most important basic contribution is the characterization of citrate lyase multi- enzyme complexes which initiate the anaerobic utilization of citrate by a number of bacteria. He also developed an immobilized penicillin acylase system which Hindustan Antibiotics Ltd. used in their semi-synthetic penicillin production plant.

Positions: Consultant, Deputy Director and Head, Biochemistry Division, National Chemical Laboratory, Pune.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: VASVIK Award (1985).

Address: 111 Anand Park, Aundh, Pune 411007; Tel: (0212) 336626.

SODHA, Mahendra Singh

Elected 1978

Born 8 February 1932; Ajmer, Rajasthan
D.Phil. (1955), University of Allahabad

Specialization: Solar Energy, Plasmas, Semiconductors, Optics

Research Achievements: Sodha has carried out: (i) studies on self-focusing of laser beams in plasmas; analysis of nonlinear interaction of electromagnetic waves with plasmas by simultaneous solution of Boltzmann's transfer equation and Maxwell's equations; analysis of electromagnetic wave propagation in radially inhomogeneous media and application to inhomogeneous optical waveguides; and thermal analysis of solar energy applications. In late 1980s Sodha was rated, according to citation analysis, as the most productive Indian research worker in renewable energy.

Positions: Vice-Chancellor, University of Lucknow (1992-) and Indore University (1988-92);Chief Technical Advisor, Energy Conservation and Renewable Energy, Government of Cyprus/World Bank/Unesco (1983-85);Professor of Physics, Joint Professor of Energy Studies, (1964-88); Deputy Director, Dean and Head of Department, Indian Institute of Technology, New Delhi; Visiting Professor, Drexel University, USA; Senior Scientist and Chief of Space Physics, Republic Aviation Co., Farmingdale, USA (1961-64).

Learned and Professional Societies: Fellow, National Academy of Sciences (India); President, Optical Society of India and Plasma Science Society of India.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1974); Hari Om Ashram Prerit Shri S. S. Bhatnagar Award (1978); UGC National Lecturer.

Author/Editor Facet: Authored/edited 14 books; coedited 'Reviews of Renewable Energy Resources' and 'Progress in Energy Conversion'; member, editorial boards of: *Int. J. Energy*, and *J. Photovolt.*

Other Contributions: Sodha organized the Indian Science Congress Session in 1991; started *Bal Vigyan*, a children's science movement; established at Indore University a Faculty of Engineering Sciences with the following schools: Computer Science, Biotechnology, Future Studies and Planning, Energy Studies, and Laser Engineering.

Address: Vice-Chancellor, University of Lucknow, Lucknow 226 007; Tel: (0522) 71292, 381583; Fax: 91-522-381583.

SOHI, Harnek Singh

Elected 1984

Born 25 February 1930; Ropar, Punjab
Ph.D. (1966), Indian Agricultural Research Institute, New Delhi

Specialization: Mycology and Plant Pathology

Research Achievements: Sohi has developed ingenious and cost- effective methods for management of diseases affecting economic plants; developed and perfected techniques for cultivating edible mushrooms of importance to India; popularized mushroom culture, and described new taxa of fungi including edible mushrooms; and developed centres of excellence in plant pathology and mushroom culture.

Positions: Director, National Centre for Mushroom Research and Training, Solan; Project Coordinator, All India Coordinated Mushroom Improvement Project; Professor and Chairman, Department of Botany, Panjab University, Chandigarh; Senior Scientist and Head, Division of Plant Pathology, Indian Institute of Horticultural Research, Bangalore; State Plant Pathologist, Himachal Pradesh.

Learned and Professional Societies: Fellow, National Academy of Agricultural Sciences (India) and Indian Academy of Horticulture; Hony Fellow, Society of Plant Pathologists of India; President, Indian Phytopathological Society (1992); President, Indian Society of Mycology and Plant Pathology (1983); Vice-President, Indian Society of Mycology.

Lectureships: Jeersa Nidhi Award Lecture; Dr N. Prasad Memorial Lecture.

Author/Editor Facet: Member, editorial boards of: *Indian Phytopathol.* and a few other periodicals.

Policy-making Bodies: Member of many scientific committees of ICAR.

Address: Lovely Cottage, Saproon 173 211, Solan, Himachal Pradesh; Tel: (01792) 2987.

SOHONI, Viswanatha Vishnu

Elected 1942

Born 6 September 1898; Agargulen, Maharashtra
M.Sc., University of Bombay

Specialization: Meteorology

Research Achievements: Sohoni studied the thunderstorms of Calcutta and the associated atmospheric instability. Made an analysis of upper air temperature and humidity data obtained with the aid of sounding balloons, from the point of view of the stability of the atmosphere.

Positions: Meteorologist I (1922-42), Superintending Meteorologist (1942-50), Director General of Observatories (1950-53), In-Charge, Meteorological Offices at Calcutta and Karachi and of a number of Sections in the Headquarters Offices at Simla and Poona, India Meteorological Department.

Policy-making Bodies: President, WHO Regional Association for Asia (1951-53).

Author/Editor Facet: Served as editor (*ex-officio*) of *Indian J. Meteorol. Geophys*.

Other Contributions: Sohoni took interest in popularising meteorology and expounding the benefits of meteorological science.

Died 5 May 1977.

SOKHEY, Sir Sahib Singh

Foundation Fellow

Born 15 December 1887; Amritsar, Punjab
M.D. (1925), University of Edinburgh, UK

Specialization: Biochemistry, Medical Science

Research Achievements: Sokhey studied the epidemiology of plague; produced tetanus, diphtheria toxoids and the polyvalent antivenin; produced sulphathiazole and carried out research in synthetic drugs e.g. paludrine, the antimalarial drug. He installed the first molecular distillation unit in the country to separate vitamin A from shark liver oil. Great improvements made in the manufacture of plague and cholera vaccines owe much to Sokhey's efforts. He determined the average normal standards of Indian man and woman from the chemical analysis of blood, non-protien nitrogen, urine, uric acid, creatine, phosphate and other metabolic products. Produced superior qualities of plague vaccine with no toxic reaction.

Positions: Director, Haffkine Institute, Bombay; Assistant Director General, Technical Service WHO; and CSIR Emeritus Scientist (1965).

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Member, Council (1935-38, 1946-47), Vice-President (1948-49), INSA.

Awards and Honours: President, Medical Section, Indian Science Congress (1935); Knighted (1946); Hony Major-General; Lenin Peace Prize (1947).

Policy-making Bodies: Sokhey was closely associated with CSIR in building up its chain of national laboratories, especially NPL and NCL as well on CSIR's research committees like Pharmaceuticals and Drugs Committee; served WHO on its Biological Research Committee. Earlier, he was associated with the Planning Committee of Indian National Congress.

Other Contributions: Sokhey was closely associated with Scientific Workers Association (sometime President) and Indian Peace Council. He played a key role in the setting up of Hindustan Antibiotics (Pimpri) and Indian Drugs and Pharmaceuticals Ltd.

Died 23 October 1971.

SOMAYAJULU, Bhamidipati Lakshmidhara Kanakadri

Elected 1983

Born 5 March 1937; Vishakhapatnam, Andhra Pradesh
Ph.D. (1969), University of Bombay

Specialization: Marine Geochemistry and Oceanography

Research Achievements: Using long-lived cosmic ray (CR), Somayajulu produced ^{10}Be and ^{32}Si and those of the U-Th decay series; showed that (i) the CR intensity has not varied by more than 50% in the past 2 m.y.; (ii) ^{10}Be is well suited for studying past melt water inputs; (iii) oceanic ferromanganese/nodules grow at mm/m.y.; (iv) ^{32}Si is well suited for studying oceanic circulation, especially vertical mixing; and (v) that quaternary marine carbonate deposits range in age between 50 and 250 Ka and hold clues to the neotectonic and eustatic changes that took place in Saurashtra, Gujarat.

Positions: Professor, Physical Research Laboratory, Ahmedabad.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Indian Geophysical Union, and Geological Society of India; Member, INSA Council (1988-90).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1978); Hari Om Ashram Award (1981); UGC National Lecturer (1987-88).

Author/Editor Facet: Served on the editorial boards of: *Indian J. Mar. Sci.* and *Maha Sagar*; co-editor of 'From Mantle to Meteorites' (Indian Academy of Sciences).

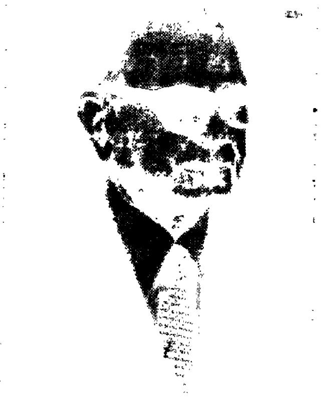
Policy-making Bodies: Member, Executive Committee, IAPSO (1970-79); Working Group, SCOR-80; and research councils of many laboratories.

Address: Professor, Physical Research Laboratory, Ahmedabad 380 009; Tel: (0272) 462129; Telex: 0121-6397; Fax: 91- 272-460502; E-mail:PRL.Ernet.In; Res: 3, New Angan Apartments, Vastrapur, Ahmedabad 380 015; Tel: (0272) 402718.

SONDHI, Ved Pall

Elected 1941

Born 10 March 1903, Jalandhar, Punjab
M.Sc. (1925), Panjab University, Lahore



Specialization: Economic Geology

Research Activities: Sondhi carried out extensive and systematic geological mapping in Burma and Assam; reported on numerous, metallic and non-metallic minerals and energy resources, e.g. new lead-silver deposits in Burma; gypsum in North West Frontier Province; sillimanite in Assam; magnesite in Uttar Pradesh Himalayas; arsenic and antimony ores in Chitral; limestone, coal and iron ore in a number of areas. He investigated several engineering geology schemes and water supply schemes, and brought to light, for the first time, the existence of earthwaves on the surface of new islands pushed up by the Makran earthquake.

Positions: Technical Advisor, Sino-Burma Boundary Commission (1936-37); Incharge of Survey Parties in Assam, Punjab, NWFP and Northern, Western and Central Circles (1942-47); Deputy Director,.Mineral Development (1947); Director, Geological Survey of India (1955-58); Chief Geologist and Director of Drilling, National Coal Development Corporation (1958-65).

Learned and Professional Societies: Fellow, Geological Society of London; Member, Mining, Geological and Metallurgical Institute of India (President 1962), and Asiatic Society; Member, INSA Council (1971-73).

Awards and Honours: MBE (1937); President, Geology and Geography Section, Indian Science Congress (1955).

Policy-making Bodies: Member, Iron Ore Board (1972-77).

Other Contributions: Sondhi played an important role in the growth of the Geological Survey of India and its scientific activities, as in organizing the prospecting wing of the National Coal Development Corporation.

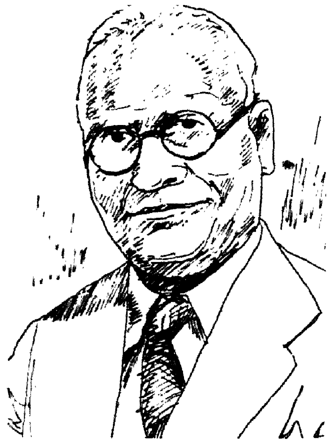
Died 31 March 1989.

SOPARKAR, Manmohandas B.

Elected 1937

Born 10 April 1884
M.D. (1913), University of Bombay

Specialization: Medical Science



Research Achievements: Soparkar was well known for his work on plague. In 1918, he devised a special medium for cultivating the influenza bacillus. He investigated human schistosomes from Indian soldiers who returned from World War I and found larval forms of several trematode parasites including animal schistosomes. Developed a method for cultivating the tubercle bacillus and studied the vitality of the organism under natural and artificial conditions and the channels of spread of the disease in human beings. Also studied animal tuberculosis. Described a new species *Cercaria patialonsis.* Discovered, for the first time, that tuberculosis among animals was not a rare disease in India. Demonstrated that the bacillus causing bovine tuberculosis in India was highly virulent. Studied various aspects of tuberculosis in men.

Positions: Indian Medical Service: Medical Officer, Plague Research Enquiry, Indian Research Fund Association (now Indian Council of Medical Research), Haffkine Institute, Bombay; Clinical Registrar of Medicine, J.J. Hospital, Bombay; Assistant Director, Central Research Institute, Kasauli, Officer-in-Charge, Bovine Tuberculosis Inquiry, Imperial Institute of Veterinary Research, Mukteswar; Assistant Director, Haffkine Institute; Hony Chief Medical Officer, Ramakrishna Medical Hospital, Bombay.

Awards and Honours: Dossabhoy Hormusjee Cama Prize (University of Bombay); Minto Gold Medal; King George V Silver Jubilee Medal; President, Medical Section, Indian Science Congress (1949).

Died 31 May 1952.

SPENCER, Edmondson *Foundation Fellow*

Born 1885; Colene, Lancashire, UK
Ph.D. (1932), University of Liverpool, UK

Specialization: Geology

Research Achievements: Spencer did field work in geology, mineralogy and metallurgy and was responsible for the discovery and exploitation of economic mineral deposits and for the development of a process for refining impure limestone for use in cement manufacture. He also did experiments on the use of bamboo as a raw material for paper production. Invented the 'cascade process of digestion' for which he received world patents. Was responsible for successful production of quality paper from bamboo pulp at Titaghur Paper Mills.

Positions: Chief Chemist, Bird Company, Calcutta.

Learned and Professional Societies: Fellow, Geological Society of London; Member, Institution of Chemists (President 1933, 1934).

Died 19 November 1955.

SREEKANTAN, Badanaval Venkata *Elected 1976*

Born 30 June 1925; Nanjangud, Karnataka
Ph.D. (1954), University of Bombay

Specialization: Cosmic Rays, High-Energy Physics, Astronomy

Research Achievements: Sreekantan's research encompasses three distinct but related areas of fundamental science, viz. cosmic rays, elementary particles, and high-energy X-ray, γ- ray astronomics. He has carried out deep underground experiments in Kolar Gold Fields (KGF), gold chamber studies of cosmic ray interactions at Ooty; X-ray, γ-ray astronomy experiments with balloons from Hyderabad and rockets from TERLS and SHAR. Also made extensive air shower experiments at Ooty and KGF.

Positions: INSA Ramanujan Professor (1987-92); Director, Tata Institute of Fundamental Research, Bombay (1975-87).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Maharashtra Academy of Sciences; Member, INSA Council (1975-77).

Awards and Honours: Homi Jahangir Bhabha Medal (INSA) (1978); C.V. Raman Award (UGC) (1977); R.D. Birla Award (Indian Physics Association) (1982); Ramanujan Award (Indian Science Congress (1989); Padma Bhushan (1988); UGC National Lecturer.

Lectureships: P.M.S. Blackett Memorial Lecture (INSA-The Royal Society) (1978).

Policy-making Bodies: Vice-Chairman, IUPAP Cosmic Ray Commission (1987-93); Chairman, Governing Councils of SAMEER and Indian Institute of Astrophysics and Research Council, National Physical Laboratory, and others.

Address: Radhakrishnan Visiting Professor, National Institute of Advanced Studies, Indian Institute of Science Campus, Bangalore 560 012.

SREENIVASAN, Arunachala

Elected 1950

Born 13 July 1909; Pamini, Tamil Nadu
D.Sc. (1936), University of Madras

Specialization: Food Science and Technology

Research Achievements: Sreenivasan has contributed to the understanding of (1) basic metabolic events and regulatory mechanisms influenced by nutritional,hormonal, and radiation effects;(2) tissue differentiation and de-differentiation processes; (3) development and evaluation of (i) protein-rich food formulations for combating protein-calorie malnutrition, and (ii) other food processing technologies; and (4) food preservation by gamma irradiation.

Positions: Consultant Food Scientist and Technologist (1976-); Director, Cancer Research Institute, Tata Memorial Centre, Bombay (1974-75); Emeritus Scientist, Bhabha Atomic Research Centre (BARC), and Adviser, Department of Atomic Energy, Bombay (1971- 73); Head, Biochemistry and Food Technology Division, BARC, Bombay (1964-71); Deputy Director, Central Food Technological Research Institute, Mysore (1959- 64); Professor, Department of Chemical Technology, University of Bombay (1943-59).

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Member, Society of Biological Chemists, India (sometime President), Nutrition Society of India (sometime President), Association of Food Scientists and Technologists (sometime President), International Congress of Food Science & Technology (sometime President); Member, INSA Council (1975-77).

Awards and Honours: Rafi Ahmed Kidwai Memorial Prize (ICAR) (1966-67); B.C. Guha Memorial Lecture Award (INSA) (1972); Outstanding Teacher Award (University of Bombay, Department of Chemical Technology, Golden Jubilee Year) (1985); Distinguished Alumnus Award (IISc, Platinum Jubilee Year) (1985); Honoured Member (Society of Biological Chemists, India) (1988); Padma Bhushan (1974).

Lectureships: Acharya J.C. Bose Memorial Lecture (1973); Golden Jubilee Lecture (Indian Institute of Science) (1979); J.G. Kane Memorial Lecture, (University of Bombay) (1980); Association of Food Scientists & Technologists Endowment Lecture (1981).

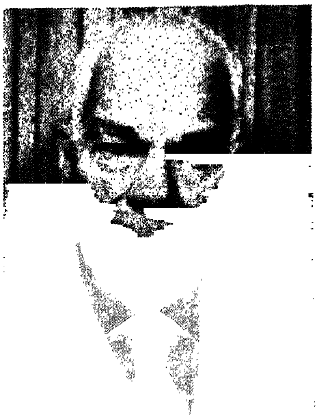
Policy-making Bodies: Leader, Indian delegation, IUB General Assembly, Stockholm (1973);Chairman, IAEA Panel on Improving Food Quality by Irradiation, Vienna (1973); Former Member, FAO/WHO Protein Advisory Group; and several boards of ICAR,ICMR, CSIR etc.

Author/Editor Facet: Served as editorial board member of some CSIR, ICMR, ICAR and other journals.

Address: 132, 6A Cross and 9th Main Road, Raja Mahal Vilas Extension, Bangalore 560 080; Tel: (080) 348046.

SRI KRISHNA

Foundation Fellow



Born 6 July 1896; Lahore, Pakistan
Ph.D. (1921), D.Sc. (1927), University of London, UK

Specialization: Chemistry

Research Achievements: A specialist in the chemistry of forest products, Sri Krishna synthesized a large number of sulphur compounds. He surveyed the raw materials in India for drugs ephedrin and santonine. Developed a sizing material from tamarind seeds for cotton and jute.

Positions: Professor of Chemistry, Panjab University, Lahore; Biochemist, Forest Research Institute, Dehra Dun; Deputy Director, Council of Scientific and Industrial Research, New Delhi; Scientific Advisor to the Indian High Commission, UK.

Learned and Professional Societies: Fellow, Royal Institute of Chemistry (London); Member, INSA Council (1948-50).

Award and Honours: President, Chemistry Section, Indian Science Congress (1940); CIE (1942).

Died 3 October 1984.

SRIDHARAN, Asuri

Elected 1992

Born 1 January 1937; Madras, Tamil Nadu
D.Sc. (1992), Indian Institute of Science, Bangalore;
Ph.D. (1968), Purdue University, USA

Specialization: Civil Engineering; Geotechnical Engineering

Research Achievements: Sridharan has been responsible for establishing areas of research on basic and fundamental aspects of the engineering behaviour of clays. His research on the physico-chemical mechanisms controlling the engineering behaviour of clays has brought out that the electrical attractive and repulsive forces at clay particle level play a dominant role in controlling the macro- engineering behaviour.

Positions: KSIIDC Professor (1991-), Chairman of Division of Mechanical Sciences (1987-), Chairman of Department of Civil Engineering (1983-87), Professor of Civil Engineering, Indian Institute of Science, Bangalore (1982-); Visiting Professor, University of Karlsruhe, Germany (1975-77).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Indian National Academy of Engineering, and Indian Geotechnical Society.

Awards and Honours: A.N. Khosla National Award (University of Roorkee) (1990); IISc Science Alumni Award (1993).

Author/Editor Facet: Member, editorial board, *J. Indian Geotech. Soc.*

Policy-making Bodies: Member of several committees of International Society of Soil Mechanics and Foundation Engineering; Member, Research Councils of Central Road Research Institute and Central Building Research, and other bodies.

Address: Chairman, Mechanical Sciences Division, Department of Civil Engineering, Indian Institute of Science, Bangalore 560 012; Tel: (080) 340416, 344411 (Ext

2467, 2478, 2286); Telex: 0845-8349; Fax: 91-80-341683; Res: 10, Duplex Quarters, IISc Campus, Bangalore 560 012; Tel: (080) 341046.

SRIDHARAN, Ramaiyengar *Elected 1980*

Born 4 July 1935; Cuddalore,Tamil Nadu
Ph.D. (1960), Columbia University, USA

Specialization: Algebra

Research Achievements: After initial work on filtered algebra and related areas, a fundamental theorem of projective geometry for rings, and restricted Line algebras, Sridharan turned his attention to cancellation of projective modules which led to a study of quadratic forms. Most recently, a new invariant was attached to involution and this has become an interesting object of study.

Positions: Professor, School of Mathematics, Tata Institute of Fundamental Research, Bombay; Professor, Centre for Advanced Study, University of Bombay (1964-67); Visiting Professor, ETH, Zurich.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Member, ISI Council, INSA Council (1990-92).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1980).

Author/Editor Facet: Editor, *Common Algebra, J. Ramanujan Math. Soc.* and *J. Indian Math. Soc.*

Address: Professor, School of Mathematics, Tata Institute of Fundamental Research, Colaba, Bombay 400 005; Tel: (022) 2152971; Res: 210, Colaba Housing Colony, Homi Bhabha Road, Colaba, Bombay 400 005; Tel: (022) 2152131.

SRINIVASAN, Mandakolathor Subramanya *Elected 1985*

Born 9 October 1938; Attilmalaipattu, Tamil Nadu
Ph.D. (1985), Victoria University of Wellington, New Zealand

Specialization: Biostratigraphy and Oceanography

Research Achievements: Srinivasan established the age distribution and facies relations of the Neogene marine sequences of the Andaman-Nicobar Islands. Integrated and in part established the evolutionary pathways of all planktonic foraminifera during the last 25 million years from tropical to polar regions using deep sea cores of the Deep Sea Drilling Projects. Has contributed towards Indian Ocean geology and palaeo-oceanography with emphasis on the Neogene.

Positions: Director, Academic Staff College (1991-), Head (1984- 86), Professor (1983-), Department of Geology, Banaras Hindu University, Varanasi.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Life Fellow, Geological Society of India and Geological, Mining & Metallurgical Society of India (Vice- President,1989-91); Member, INSA Council (1993-94).

Awards and Honours: Malaviya Memorial Foundation Award (BHU) (1986); Professor L. Rama Rao Gold Medal (Geological Society of India) (1988); UGC National Lecturer (1984-85).

Lectureships: Professor M.R. Sahni Memorial Lecture (1986,1989), Professor Abaninath Choudhury Memorial Lecture (Geological, Mining & Metallurgical Society of India) (1987); Platinum Jubilee Lecture (Indian Science Congress) (1991).

Author/Editor Facet: Authored/co-authored 'Neogene Planktonic Foraminifera', 'Initial Reports of Deep Sea Drilling' and 'Schwager's Car Nicobar Foraminifera'; served as member of editorial boards of: *Indian J. Earth Sci.* and *Indian Minerals.*

Policy-making Bodies: Leader, International Working Group on Equatorial Pacific Neogene Chronostratigraphy, Tokyo (1976); Chairman, IUGS National Committee (1985-88),Member, Indian National Committee for ICSU (1985-88); Member, Indian National Committee for IUGS-INSA (1989-91); Member, INSA Delegation to Visit USSR to finalize Indo-USSR Joint Research Projects (1990); Member, Regional Committee on Pacific Neogene Stratigraphy, Schizuoka, Japan (1992-95); and several other bodies.

Address: Professor, Department of Geology, Banaras Hindu University, Varanasi 221 005; Tel: (0542) 310290/301; Telex : 0545-304 BHU IN; Fax: 91-542-312059; Res: 26, Medical Enclave, Banaras Hindu University, Varanasi 221 005; Tel: (0542) 311887.

SRINIVASAN, Ramachandran

Elected 1986

Born 5 July 1933; Nannilam, Tamil Nadu
Ph.D. (1958), University of Madras

Specialization: Crystallography, Molecular Biophysics and Informatics

Research Achievements: Srinivasan's contributions have been essentially in structural crystallography both in theory and practice. On theoretical side, methods of structure analysis, using X-ray diffraction particularly Fourier theory and statistical applications received special attention. Special mention may be made of the proposal of Fourier representation of imaginary component in the presence of anomalous scattering, essentialy unique solution to phase problem using anomalous scattering from single wavelength measurements both of which have come into sharp focus in recent years in macromolecular crystallography with the advent of synchrotron radiation facilities. On the practical side he has developed powerful tools of analysis of data on protein structure and conformation and applied them to available large volume of protein data to yield (a) best helical parameters for the alpha helix from single crystal globular proteins (b) presence of supercoiling even in single strands (c) E-helix, an extended helical conformation and (d) subhelical distortion and their quantification. More recently, he has prposed a generalised methodology for essentially unique single parametric characterization of any biopolymer by treating biopolymers as quasi-rigid systems. Applications to proteins, double helical DNA and single stranded tRNA have been made. In the light of these methodologies some of the double helical analyses of DNA in the literature need very cautious interpretation. In solid state NMR he developed a powerful new method of line shape analysis using truncated moments which can be used for motional studies. He has been instrumental in the creation of NICRYS, a hard-data informatics centre at Madras relating to crystallography, perhaps first of its kind in this region of Asia.

Positions: Senior Professor and Head, Department of Crystallography and Biophysics and Hony Director, NICRYS, University of Madras.

Learned and Professional Societies: Fellow, Institute of Physics (London) and Indian Academy of Sciences; Founder Fellow, Tamil Nadu Academy of Sciences; Member, Indian Physics Association, Indian Biophysical Society; New York Academy of Sciences, and National Academy of Sciences (India).

Awards and Honours: C.V Raman Research Gold Medal (Madras) (1962).

Author/Editor Facet: Contributed nine volumes in the area of crystallography and Biophysics (by Pergamon, John Wiley and others) and one on 'Statistical Applications' has been translated into Russian.

Policy-making Bodies: Consultant (formerly member), IUCr, Teaching Commission.

Other Contributions: Srinivasan organized special seminars on musicology sponsored by Sangeet Natak Academy (1981). He even contributed a research article on computer applications to musicology to a commemorative volume which he edited.

Address: Senior Professor & Head, Department of Crystallography and Biophysics, NICRYS, University of Madras, Madras 600 025; Tel: (044) 2351367; Res: 50, 4th Main Road, Raja Annamalaipuram, Madras 600 028; Tel: (044) 836057.

SRIRAMACHARI, Samavedam

Elected 1976

Born 25 June 1925
M.B.B.S. (1948), M.D. (1955), D.Sc. (1961), Andhra University, Waltair; D.Sc. (*h.c.*), Sri Venkateswara University (1975) and Andhra University (1978)

Research Achievements: Sriramachari has contributed to several areas of pathology, both human and experimental, viz nutritional, hepatic, osteo- and neuro-pathology, and pathology and toxicology in the case of Bhopal gas leakage. In nutritional pathology, his work relates to vitamin A and D deficiency, nutritional fatty livers, reversibility of experimental cirrhosis, pathology of kwashiorkor and Indian Childhood Cirrhosis (ICC) and its reversibility. With regard to neuro-pathology he proved that Nagpur Encephalopathy Syndrome in children resulted from environmental heat hyperpyrexia. Developed a primate model of experimental neurolathyrism; made extensive studies on experimental cerebral oedema in monkeys comparable to head injuries in man. He has done pioneering work in scientific microscopy and photography and development of indigenous low-cost mass-production of teaching aids. On the histopathology and toxicology of the Bhopal gas leak, he carried out, among others, experimental studies of acute and chronic toxicity due to methyl isocyanate and some of its derivatives. With regard to ICC, he studied the role of trace elements (copper, zinc, selenium) in its etiopathogenesis. Developed for the first time an experimental model of ICC based on abnormal use of certain traditional home remedies.

Positions: INSA Senior Scientist (1989-92); Additional Director General, Indian Council of Medical Research; Founder-Director, Institute of Pathology, (earlier, Indian Registry of Pathology) (1965), Associate Professor, Head, Department of Neuropathology, All India Institute of Mental Health, Bangalore (now NIMHANS) (1959); Assistant Research Officer (Pathologist), Nutrition Research Laboratories, Coonoor (now NIN, Hyderabad) (1952).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Andhra Pradesh Academy of Sciences, National Academy of Medical Sciences (India), and Forensic Science Society of India; Member, Indian Association of Pathologists and Microbiologists, Neurological Society of India (sometime President), Nutrition Society of India, Society for Scientific Values, and Indian Association for Study of Liver (IASL); Additional Member (1981- 82), Vice President (1983- 84), INSA.

Awards and Honours: Shakuntala Amirchand Award (ICMR) (1954); Dr.B.C. Roy Award (Medical Council of India) (1979); J.C. Bose Award (Hari Om Ashram-UGC) (1981); Bashambar Nath Chopra Memorial Lecture Award (INSA) (1983); Silver Jubilee Research Fund Award (MCI) (1991); Padma Shri (1985).

Lectureships: Dr.Arun Kumar Banerjee Memorial Oration (PGI, Calcutta) (1975); Basanti Devi Amirchand Oration (ICMR) (1975); R.V. Rajam Oration (NAMS) (1978); J.B. Chatterji Oration (STM, Calcutta) (1983); B.C. Guha Oration (Indian Science Congress Association) (1983); D.V. Dutta Oration (IASL) (1991); Bhushan Rao Memorial Oration (Indian Academy of Forensic Medicine) (1991); Dr.P.C. Mahalanobis Centenary Celebration Lecture (Indian Statistical Institute) (1993).

Author/Editor Facet: Editor: *Indian J. Hist. Sci.* (1993-).

Other Contributions: As Founder Director, he has developed the Institute of Pathology into a leading centre of research in this field. Chairman, Supreme Court Committee, for determining the adequacy of detoxification in Bhopal gas leak disaster.

Address: Hony Scientist, Institute of Pathology (ICMR), Safdarjang Hospital Campus, Post Box No.4909, New Delhi 110 029, Tel: (011) 6868402-5 (Ext 310); Res: No.521, Mandakini Enclave, Kalkaji P.O., New Delhi 110 019; Tel: (011) 6444943.

SRIVASTAVA, Bishwambhar Nath

Elected 1946

Born 23 August 1905; Bhagmalpur, Uttar Pradesh
D.Sc. (1939), University of Allahabad

Specialization: Physics, Thermodynamics

Research Achievements: Srivastava made extensive contributions to the study of thermal ionization and thermal dissociation, both from theoretical and experimental points of view. He also did much work in quantum statistics, electronics, thermal conductivity of gases and gaseous mixtures and low-temperature physics.

Positions: Professor and Head, Department of General Physics and X-rays, Indian Association for the Cultivation of Science, Calcutta (1953-70).

Learned and Professional Societies: Fellow, Physical Society (London).

Author/Editor Facet: Co-authored (with M.N. Saha) 'A Treatise on Heat' (more than 12 edns); served as editor of *Indian J. Phys.* for several years.

Policy-making Booies: Member, Commission I, International Institute of Refrigeration.

Died 20 May 1981.

SRIVASTAVA, Chandra Mani

Elected 1987

Born 10 January 1932; Ballia, Uttar Pradesh
Ph.D. (1957), University of London, UK

Specialization: Ferromagnetic Resonance and Relaxation, Superconductivity and Materials Science

Research Achievements: Srivastava analyzed the line-shift and line broadening in FMR arising from eddy currents and inhomogeneous demagnetization. Studied the origin of uniaxial anisotropy in LPE-grown films. Made estimates of transfer integrals in ferromagnetic systems using Anderson's theory of superexchange. Proposed a new mechanism of pairing of electrons in superconductors based on the quenching of Darwin interaction.

Positions: Head of Materials Science Centre (1976-91), Head of Advanced Centre for Research in Electronics, (1976-91); Head of Department of Physics (1971-73), all at Indian Institute of Technology, Bombay.

Learned and Professional Societies: Fellow, National Academy of Sciences (India) and Maharashtra Academy of Sciences.

Author/Editor Facet: Published two books: 'Introduction to the Theory of Special Relativity' (Orient Longman,1972) and 'Science of Engineering Materials' (Wiley Eastern, 1987); edited 2 books: 'Recent Advances in Materials Research'(1984) and 'Advances in Ferrites' (1989); member, board of editors, *Bull. Mater. Sci.* (till 1992).

Policy-making Bodies: Member, International Committee of International Conference on Ferrites, a subsidiary of Japan Society of Powder and Powder Metallurgy.

Address: 604, Prema Apartments, Opposite IIT Main Gate, Powai, Bombay 400 076; Tel: (022) 5787127.

SRIVASTAVA, Har Dayal

Elected 1960

Born 15 June 1908
D.Sc. (1938); University of Allahabad

Specialization: Parasitology

Research Achievements: Srivastava studied various aspects of helminthology-survey, morphology, taxonomy, life history, pathogenicity, etiology of obscure diseases, treatment, control, including biological control, host-parasite relationship, immunity, and zoonosis. He did extensive work on the morphology and taxonomy of trematode parasites of Indian fresh-water and marine fishes; life history, pathogenicity and biological control of *Cotylophoron cotylophorum* of ruminants; a unique form of dermatitis in cattle (cutaneous microfilariasis), referred to in literature as Srivastava's dermatitis of cattle; causative parasite of cutaneous bleeding in buffaloes; prenatal infection of *Neoascaris vitulorum* in buffaloes; life history of *Stephanofilaria assamensis,* the causative parasite of hump sore of cattle, and its treatment; schistosomiasis in Indian domestic animals; verminous pneumonia in buffaloes and life history of *Artyfechinostomum sufrartyfex* and *Gastrodiscoides hominis,* trematodes of great zoonotic importance.

Positions: Helminthologist, Senior Professor of Parasitology, Head, Division of Parasitology and Director, Indian Veterinary Research Institute, Mukteswar/ Izatnagar; Emeritus Scientist, Indian Council of Agricultural Research.

Learned and Professional Societies: Fellow, National Academy of Sciences (India); President, Zoological Society of India and Helminthological Society of India; Founder President, Indian Society for Parasitology.

Awards and Honours: Bhalerao Memorial Gold Medal (1960); Rafi Ahmed Kidwai Memorial Prize (1968).

Policy-making Bodies: Member, Unesco Expert Committee on Animal Ecology for Arid Zone; also served on several expert committees of ICAR.

Died 26 October 1989.

SRIVASTAVA, Piare Lal

Elected 1935

Born 11 February 1898; Uttha, Uttar Pradesh
D.Phil. (1927), University of Oxford, UK

Specialization: Mathematics

Research Achievements: Srivastava contributed to the theory and functions of complex variables and Dirichlets series as acknowledged by Hadamard of France, Littlewood of Cambridge, and Titchmarsch of Oxford.

Positions: Reader, Professor and Head, Department of Mathematics, University of Allahabad (1929-60); Vice- Chancellor, Bihar University, Muzaffarpur.

Learned and Professional Societies: Fellow, National Academy of Sciences, India (President 1955-57); Additional Vice- President, INSA (1944, 1956-57, 1962).

Author/Editor Facet: Srivastava's works found a place in 'Introduction to the Theory of Fourier Integrals' (1937).

Other Contributions: An educationist of great reputation, managing one of Kanpur's '*Pathshalas*', Srivastava served the cause of education also as member of Uttar Pradesh Legislative Assembly for over a decade.

Died 13 July 1970.

SRIVASTAVA, Pratap Narain

Elected 1977

Born 1 July 1927; Basti,Uttar Pradesh
D.Phil. (1951), University of Allahabad

Specialization: Radiation Biology

Research Achievements: Srivastava has done much work on the radiation effects on adult mice during pre-natal and post- natal development. For a long time, the relative biological effectiveness of tritium with respect to ^{60}Co had been considered to be 1. His work, along with others, has led to its upward revision. His work on the mechanism of action of radioprotective drugs has received recognition. His recent work on entrapping radioprotective drugs with liposomes and then targeting them to particular tissues by linking specific antibodies on to the surface of liposome has great potential for reducing the quantity of toxic radioprotective drugs.

Positions: Member, Planning Commission, Government of India; Vice-Chancellor, Jawaharlal Nehru University (JNU), New Delhi; Professor, University of Rajasthan, Jaipur; and Professor, Dean and Rector (Pro-Vice-Chancellor), JNU, New Delhi.

Learned and Professional Societies: Fellow (President, Biological Sciences, 1978), National Academy of Sciences (India), Royal Microscopical Society (UK), and Linnean Society (London); Treasurer,INSA (1985-88).

Awards and Honours: UGC National Lecturer (1977-78); UGC National Fellow (1979-81); Professor Emeritus for Life, JNU; FICCI Award (1984); Gold Medal, Institute of Oriental Philosophy, Japan (1986); Aryabhata Medal (INSA) (1989); K.N. Bahl Memorial Gold Medal, (Indian Society of Biosciences) (1990); Atma Ram Award (Ministry of Human Resource Development) (1991); Professor Distinguido (La Universidad Externado De Colombia, Bogota) (1992); President, Indian Science Congress (1993-94).

Lectureships: B.C. Guha Professorial Oration (1985); Brig. S.K. Mazumdar Oration (1988); Dr. A. Lakshmanaswami Oration (National Academy of Medical Sciences, India) (1990); Professor L.S. Ramaswami Oration (University of Rajasthan) (1991); Platinum Jubilee Lecture, Indian Science Congress (1991).

Policy-making Bodies: Member, General Scientific Secretary (1983- 87) and President (1987-); International Council of Scientific Development, Heidelberg; Executive Council, IUBS (1988-91), Technical Expert Committee, IAEA (1987-), Committee for the National Policy of Education (1985-86), its Plan of Action (1986, 1992), Governing Council, International Association of Universities, Paris (1985-90; 1990-95); and, Scientific Advisory Committee, Ministry of Health and Family Welfare (1992-).

Other Contributions: Srivastava has been responsible for introducing teaching and research in radiation biology in the university system, which has led to the installation of pelletron accelerator at Nuclear Science Centre, JNU Campus, New Delhi.

Address: Nuclear Science Centre, Jawaharlal Nehru University Campus, New Delhi 110 067; Tel: (011) 6893955, 6892601, 6892603, 6893467, 6891410; Telex: 031- 73275 NSC IN; Fax: 91-11-6893666; E-mail: uunet! shakti! vikram!nsc; Res: F1/128, Asiad Games Village, Madanlal Block, New Delhi 110 049; Tel: (011) 6493322.

SRIVASTAVA, Uma Shankar

Elected 1979

Born 20 March 1924; Allahabad, Uttar Pradesh
D.Phil. (1947), University of Allahabad; D.I.C. (1958), University of London, UK

Specialization: Entomology (Insect Endocrinology & Developmental Biology)

Research Achievements: Srivastava has made original contributions in insect endocrinology and insect developmental biology. He was the first to demonstrate the true moulting glands in Coleoptera and also the first to show time juvenilising effects of JH/JHA in higher Diptera. He reported that treatment of eggs on embryogenesis and postembryonic development is related to the hormone dose and stage of treatment; and he has shown that insects with different ecological habitat respond differently to juvenoid treatment. He has also studied postembryonic development of several organs or organ systems in insects.

Positions: Emeritus Scientist, National Academy of Sciences (India); Professor and Head, Department of Zoology (1969-84), Dean, Faculty of Science, University of Allahabad (1978-81); University Professor (1963-69), Dean, Faculty of Science (1965-67), Bihar University, Muzaffarpur; Assistant Professor, University of Allahabad (1947-63); Visiting Professor, North Western University, Evanston, Illinois, USA

Learned and Professional Societies: Fellow, National Academy of Sciences (India) (President), Entomological Society of India (sometime Vice-President), Zoological Society of India (sometime General Secretary), and Indian Society of Developmental Biologists (sometime President).

Awards and Honours: Sir J.C. Bose Award (Hari Om Trust-UGC) 1982); President, Zoology Entomology & Fisheries Section, Indian Science Congress (1976); UGC National Lecturer.

Author/Editor Facet: Editor, 'Glimpses of Science in India' (Malhotra Pub., 1991), 'Science & Technology for National Development', 'Utilization of the Living Resources of Indian Seas', 'Inputs of Science & Technology for Development of Wastelands' (all of Nat. Acad. Sci. India, 1989), *Proc. Nat. Acad. Sci. India,* and *Nat. Acad. Sci. Lett.;* author of books for children in Hindi.

Address: National Academy of Sciences, India, 5 Lajpat Rai Road, Allahabad 211 002, Tel: (0532) 641183, 640224; Res: 100 B, CSP Singh Marg, Allahabad 211 002, Tel: (0532) 622151.

STEWART, Lt. Col. Alexander Dron

Foundation Fellow

Born 22 June 1883, Blairgowrie, Scotland, UK
M.B.Ch.B. (Hons) (1906), F.R.C.S., D.T.M (1913), LL.D. *(h.c.),* University of Edinburgh, UK; D.P.H. (1920)

Specialization: Medical Science, Epidemiology

Research Achievements: Stewart did much work on cholera, plague, blackwater fever, malaria, nutrition, epidemic dropsy, sanitation and health. He carried out morbidity surveys, epidemiological investigations and made new innovations in public health practice, e.g. establishment of primary rural and urban health services.

Positions: Health Officer, Indian Medical Service, Simla (1914- 18); Director, Public Health; Professor of Hygiene, School of Tropical Medicine and Hygiene, Calcutta (Founder Director, All India Institute of Public Health and Hygiene); Principal and Superintendent, Medical College Group of Hospitals, Calcutta; Secretary General, Medical College of Calcutta; Superintendent, Royal Infirmary, Edinburgh.

Learned and Professional Societies: Fellow, Royal College of Physicians (Edinburgh) and Royal Society of Edinburgh.

Awards and Honours: President, Indian Science Congress (1933); CIE (1934); Order of St John of Jerusalem (1934).

Author/Editor Facet: Co-authored a book entitled 'Public Health Laboratory Practice'.

Other Contributions: Stewart was a great medical administrator and a man of selfless devotion to medical service. Distinguished himself in military and civil services.

Died 16 August 1969.

SUBBA RAO, Ganugapati Sree Rama

Elected 1987

Born 21 August 1937; Kolavennu, Andhra Pradesh
D.Sc. (1962), Andhra University, Waltair; Ph.D. (1966), University of Manchester, UK

Specialization: Organic Chemistry

Research Achievements: Subba Rao has developed a new synthesis of natural products, based on dihydrobenzenes, obtained through Birch reduction of aromatic compounds. Has investigated the mechanism of dissolving metal reduction and its application to the synthesis of steroid hormones, oral contraceptives, in particular.

Positions: Professor, Department of Organic Chemistry, Indian Institute of Science, Bangalore.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1982); UGC National Lecturer (1986).

Address: Professor, Department of Organic Chemistry, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2524); Telex: 0845-8349 BG IISc IN; Fax: 91- 80-341683; E-mail: ocgsrs@orgchem.iisc.ernet.in; Res: Duplex Quarter No.2, IISc, Bangalore 560 012; Tel: (080) 346482.

SUBBA RAO, Gundlapalli Venkata

Elected 1992

Born 12 December 1940; Bapatla,Andhra Pradesh
Ph.D. (1969), Indian Institute of Technology (IIT), Kanpur

Specialization: Solid State Chemistry, Materials Science

Research Achievements: Subba Rao's achievements in general are in materials science and solid state chemistry, with emphasis on the synthesis, characterization, fabrication and study of physical and physicochemical properties of new and novel solid-state materials. His specific achievements relate to electronic ceramics, use of powder metallurgical techniques for their fabrication, ternary low-T_C and high-T_C ceramic oxide superconductors, ionically conducting solids, ternary alloys and materials for chemically trapping solar energy. Deriving correlations between crystal structure and physical properties in ordered inorganic solids and alloy systems has been at the core of his research.

Positions: Director, Central Electrochemical Research Institute, Karaikudi (1992 -); Visiting Professor, National University of Singapore, Singapore (1988); Visiting Professor, Argonne National Laboratory, USA (1980); Professor and Head, MRSC, IIT, Madras.

Learned and Professional Societies: Fellow, Royal Society of Chemistry, (London), American Institute of Chemists, and National Acdademy of Sciences (India).

Awards and Honours: Material Research Society of India's Medal and Prize (1990, 1991).

Author/Editor Facet: Member, editorial boards of: *Bull. Mater. Sci.* (*India*) and *Mater. Chem. Phys.*

Policy-making Bodies: IUPAC National Representative on High Temperature and Solid State Chemistry; Member, National Task Group (Basu Research) on 'High-T_C Superconductors' (DST); Member, National Task Force on 'Chemical Routes for Solar Energy Conversion (MNES); Member, CSIR Project Advisory Committee on Materials Science.

Other Contributions: Pioneered studies of Chevrel phase low T_C superconducting materials in India and in collaboration with various research groups within the country examined the crystallography, normal state and superconducting properties of a variety of pure and solid solution phases to arrive at the structure-property correlations and possible improvements in T_C.

Address: Director, Central Electrochemical Research Institute, Karaikudi 623 006; Tel: (04565) 2064, 2088 (Off); Telex: 0443- 211; Fax: 91-4565-2088; E-mail: cerik@sirnetb.ernet.in; Res: S- 13, CECRI Quarters, Karaikudi 623006; Tel: (04565) 2156

SUBBA RAO, Nanjappa Shamanna *Elected 1983*

Born 9 December 1926; Bangalore, Karnataka
Ph.D. (1958), University of Madras

Specialization: Soil Microbiology

Research Achievements: Subba Rao has done pioneering work on root exudates and root surface microorganisms using facile techniques and labelled compounds.

His findings have added to our knowledge on rhizosphere biology. Studies on physiology and ecology of *Rhizobium*-legume root nodulation and associative symbionts like *Azospirillum* have led to the development of biofertilizers for legumes, sorghum and millets.

Positions: Professor of Microbiology, Indian Institute of Science, Bangalore.

Learned and Professional Societies: Member, Association of Microbiologists of India (President, 1979).

Awards and Honours: P.B. Sarkar Endowment Prize (ICAR) (1977- 80).

Lectureships: Vyas Memorial Lecture (Association of Microbiologists of India) (1981).

Author/Editor Facet: Authored two monographs: 'Soil Microorganisms and Plant Growth' and 'Biofertilizers in Agriculture'; edited two monographs: 'Recent Advances in Biological Nitrogen Fixation' and 'Advances in Agricultural Microbiology'; member, editorial boards of two CSIR journals.

Policy-making Bodies: Member, Advisory Committees of CSIR, ICAR, IITA, FAO and UNDP, etc; Chairman, BIS Committee on Quality Control of Microorganisms.

Address: Sumukha, 452, 11th Main Road, Rajamahal Vilas Extension, Upper Palace Orchards, Bangalore 560 080.

SUBBARAO, Eleṣwarapu Chinna

Elected 1978

Born 8 August 1928; Narsapur, Andhra Pradesh
Ph.D. (1957), Pennsylvania State University, USA

Specialization: Materials Science/Engineering

Research Achievements: Subbarao has made contributions to structure-property correlations in materials. Important examples are bismuth-containing ferroelectric compounds with layer structure with high Curie temperatures; superionic conductors based on zirconia and thoria; martenistic transformation in zirconia; and Mischmetal cobalt permanent magnets.

Positions: Director, Tata Research Development and Design Centre, Pune; Professor, Department of Metallurgical Engineering, Indian Institute of Technology, Kanpur; Fellow Engineer, Westinghouse Research Laboratories, Pittsburgh, USA.

Learned and Professional Societies: Member, Indian Ceramic Society and Indian Institute of Metals; Fellow, International Academy of Sciences, Indian Institute of Ceramics, and Indian Academy of Sciences; Member, INSA Council (1982-84).

Awards and Honours: National Metallurgists' Day Award (1970); Homi Bhabha Award (1978); BHEL Award (1982).

Lectureships: I.D. Varshnei Memorial Lecture (1987); P.R. Roy Memorial Lecture (1992).

Author/Editor Facet: Authored 'Experiments in Material Science'; edited two books: 'Solid Electrolytes and Their Applications (Plenum Press) and 'Science and Technology of Rare Earth Materials (Academic Press).

Policy-making Bodies: Member, Technology Development Council, Electronics Commission (1973-80) and National Advisory Committee on Electronics, Science & Engineering Research Council (DST) (1975-79); Indo-US Science & Technology Institute.

Address: Director, Tata Research Development and Design Centre, 1, Mangaldas Road, Pune 411 050; Tel: (0212) 661608; Telex: 0145- 7464 TCSP IN; Fax: 91-212-664713, Gram: TATARESDEV; Res:14 Gidney Park, Pune 411 001; Tel: (0212) 653757.

SUBRAHMANYAM, Nekkalapudi Chinna *Elected 1992*

Born 15 October 1943; Manthena, Andhra Pradesh
Ph.D. (1973), University of Guelph, Canada

Specialization: Plant Molecular Biology, Genetics, Biotechnology

Research Achievements: Subrahmanyam demonstrated selective chromosomal elimination following interspecific hybridization -- a novel method of a haploid production; hemizygous ineffective genetic control of chromosome pairing; number of rRNA cistrons on chromosomes 6 and 7; selective repression of rRNA loci in interspecific hybrids; satellite DNA patterns -- chromosomal localization; and differential amplification of rDNA repeats in altered karyotypes of barley.

Positions: Dean, School of Life Sciences; Coordinator, Biotechnology Programme; Coordinator, UGC-DSA, Life Sciences, University of Hyderabad, Hyderabad ; Professor and Head, Department of Botany, University of Poona, Pune (1986-87).

Learned and Professional Societies: Elected Member, New York Academy of Sciences; Fellow National Academy of Agricultural Sciences (India).

Address: Dean, School of Life Sciences. University of Hyderabad, Hyderabad 500 0134; Tel: (0842) 289210; Telex: 425-2050 UHYD-IN; Fax: 91-842-253145; E-mail: scn- sl@uohyd.ernet.in; Res: A-10, Central University Campus, Hyderabad; Tel: (0842) 289253.

SUBRAHMANYAN, Vaidyanatha

Foundation Fellow

Born 16 September 1902; Sirkazhi, Tamil Nadu
D.Sc. (1927), University of London, UK

Specialization: Biochemistry, Food Technology

Research Achievements: Subrahmanyan's researches spanned biochemistry, food processing and nutrition. Under his stewardship at Central Food Technological Research Institute a great deal of the work was done in such areas as processing of cereals, pulses, oilseeds and buffalo milk, and preservation of fruits, vegetables and fish. During 1968-69, Subrahmanyan helped start a paddy- processing research centre. Several findings of practical importance emerged from the centre, e.g. application of salt spray for quick ripening and increased yield of paddy, elimination of smell and increased yield of parboiled rice, and production of oilrich bran, all of which found applications.

Positions: Professor, Department of Biochemistry, Indian Institute of Science, Bangalore (1927-48); Planning Officer and Director, Central Food Technological Research Institute, Mysore (1948-till retirement); CSIR Emeritus Scientist; FAO Food Technologist, Philippines (1964-66); Adviser, Subsidiary Foods and Nutrition, Ministry of Food and Agriculture, Community Development and Cooperation, New Delhi (1966-69); Project- Coordinator and Director, Paddy Processing Centre, Tiruvaroor, Tamil Nadu (1969-79).

Learned and Professional Societies: Founder Member, Society of Biological Chemists (India), Fellow, Indian Academy of Sciences; Member, INSA Council (1938, 1952-54 and 1959-60).

Awards and Honours: H.K. Sen Medal (Institution of Chemists of India) (1959); Rafi Ahmed Kidwai Memorial Prize (1960, 1963); Babcock-Hart Award (Institute of Food Technologists, USA) (1962); Friesland Award (Netherland Association for the Advancement of Dairy Science) (1963); K.G. Naik Gold Medal (1964); Awards of Recognition (Philippine Association of Nutrition and Food Technologists) (1966); Bires Chandra Guha Memorial Lecture Award (INSA) (1969); Padma Shri (1960).

Other Contributions: Organized the Central Food Technological Research Institute and developed it as one of the largest and best equipped research institutions in the country.

Died 30 January 1979.

SUBRAMANIAM, Anantharama Parameswara

Elected 1958

Born 7 March 1921; Palghat, Kerala
Ph.D. (1952), Princeton University, USA

Specialization: Geology

Research Achievements: Subramaniam worked on the alkaline rocks at Sivamalai of the calciphyres near Nanjangud, (Mysore) on industrial rocks and minerals from the Sithampundi complex, Madras, on petrology of the anorthosite-gabbro mass at Kadavur, Madras, and on paragenesis of garnets in charnockite and related granulites and bleaching clays, Madras. His special interests were in metamorphic and igneous petrology, geochemistry, tectonics and genesis of sulphide ore deposits. He supervised detailed studies on the bauxite deposits of Western India and was responsible for bringing to light a large deposit of fluorspar at Amba Donga in Baroda District, Gujarat.

Positions: Petrologist, Deputy Director-General, Geological Survey of India.

Learned and Professional Societies: Fellow, Geological Society of London and Geological Society of Japan; Member, Society of Economic Geologists, and Mineralogical Societies of America and Great Britain.

Awards and Honours: Royal Society Bursary.

Author/Editor Facet: Co-edited 'Advancing Frontiers in Geology and Geophysics'- M.S. Krishnan 65th birthday volume.

Died 22 April 1973.

SUBRAMANIAN, Chirayathumadom Venkatachalier

Elected 1960

Born 11 August 1924
Ph.D. (1948), D.Sc. (1957), University of Madras

Specialization: Mycology, Plant Pathology, Fungal Taxonomy

Research Achievements: Subramanian's most significant contributions are on fungal taxonomy, particularly of hypomycetes and their teleomorphs. He proposed a classification of hypomycetes, built on the developmental morphology of anamorph and teleomorph supported by a new terminology. He has done extensive work on soil mycology and soilborne diseases and on soil, coprophillous, litter and other ecological groups of fungi.

Positions: Emeritus Scientist (1989-), INSA Senior Scientist (1989-92), Central Institute of Medicinal and Aromatic Plants, Lucknow (1989-); Visiting Professor, National University of Singapore, Singapore (1986-87); Jawaharlal Nehru Fellow (1976- 78); Director (1973-85), Professor and Senior Professor of Botany, Centre for Advanced Study in Botany, University of Madras, Madras (1964-85); Professor and Head, Department of Botany, University of Rajasthan (1960- 64); Professor, Plant Pathology, Postgraduate School, Indian Agricultural Research Institute, New Delhi (1958-60).

Learned and Professional Societies: Fellow, Indian Academy of Sciences (Vice-President, 1974-85); President, Indian Botanical Society (1972), Mycological Society of India (1985), and International Mycological Association (1977-83); Member, INSA Council (1970-71).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1965); Rafi Ahmad Kidwai Memorial Prize (ICAR) (1972-73); Birbal Sahni Medal (Indian Botanical Society) (1972);President, Botany Section, Indian Science Congress (1975); T.S. Sadasivan Endowment Lecture Award (INSA) (1988); UGC National Lecturer (1972).

Lectureships: Mundkur Memorial Lecture (Indian Phytopathological Society); Birbal Sahni Memorial Lecture; M.O.P. Iyengar Endowment Lecture; P. Parija Memorial Lecture (BHU) (1991); and several others.

Author/Editor Facet: Published three books including 'Hyphomycetes: Taxonomy and Biology' (Academic Press, 1983); edited/co-edited two books: 'Taxonomy of Fungi' (University of Madras); 'Mangrove Microbiology' (Unesco, 1988); editor-in-chief, *Kavaka* (1973-); chairman, editorial board of *Proc. Indian Acad. Sci. (Plant Sci.)* (1976-85); member, advisory boards of: *Rev. Mycol. Bacteriol. Virol.* (1983-); member, editorial board of *Mycopathol. Mycol. Appl.*, (1961-68); joint editor, *J. Indian Bot. Soc.* (1965-70) and *Proc. Indian Nat. Sci. Acad. (Pt B)* (1974- 77).

Policy-making Bodies: Member, CAB Quinquennial Review Committee for Commonwealth Mycological Institute (CMI) (1981), Advisory Committee, CMI (1982-84) and National Committee for IUBS of INSA (1975-83).

Address: Central Institute of Medicinal and Aromatic Plants, Post Bag No. 1, RSM Nagar, P.O., Lucknow 226 016; Tel: (0522) 71170,71568; Res: Anjaneya, Plot 885, 62 Ramaswami Salai, K. K. Nagar, Madras 600 078.

SUBRAMANIAN, Sankaran *Elected 1990*

Born 30 March 1942
Ph.D. (1968), University of Leicester, UK

Specialization: Physical Chemistry - Magnetic Resonance

Research Achievements: Subramanian has contributed to the understanding of the structure of transition and non-transition element paramagnetic species with respect to electronic structure, effect of lattice distortions, Jahn- Teller effect, charge-compensation and molecular motion. He had developed, in collaboration with his colleagues and students, a non-empirical NDDO MO methodology for calculation of molecular electronic strucuture and properties. Analyzed collective modes of NMR coherence transfer via scalar coupling. This has led to very interesting one- and two- dimensional NMR experiments. Developed a new sensitivity enhanced two-dimensional heteronuclear shift correlation experiment that is two orders more efficient than conventional methods. Also developed one-dimensional NMR methods to generate pure-phase subspectra using homonuclear Hartmann-Hahn transfer among local, coupled networks in large biomolecules, which simplify spectral analysis.

Positions: Professor of Chemistry, Regional Sophisticated Instrumentation Centre, Indian Institute of Technology, Madras; Visiting Scientist, NIH, Bethesda, USA (1985-86).

Author/Editor Facet: Co-authored a book entitled 'Modern Techniques in High Resolution FT-NMR'.

Address: Professor, Regional Sophisticated Instrumentation Cetre, Indian Institute of Technology, Madras 600 038; Tel: (044) 2351365 (Ext 3150); Telex: 041 21062 IITM IN; Gram: Technology; Res: Plot No.10-11, Ayodhya Colony, Velachery, Madras 600 042; Tel: (044) 2350942.

SUBRAMANYAM, Krishnaier

Elected 1980

Born 1 November 1915
D.Sc. (1951), University of Mysore; Ph.D. (1955), Cornell University, USA

Specialization: Botany, Taxonomy

Research Achievements: Subramanyam worked on taxonomy and floristics including nomenclature of plants; aquatic angiosperms; comparative morphology and systematic and phylogenetic embryology; medicinal weeds and poisonous plants; palynology; cytogenetics and evolution; and endangered species.

Positions: Director and Botanical Adviser, Botanical Survey of India, Government of India; Retired Teacher (UGC Scheme), Department of Botany, Central College, Bangalore University, Bangalore.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Indian Botanical Society; Life Member, International Society of Plant Morphologists and Botanical Society of Bengal; Member, Botanical Society of America, International Association of Plant Taxonomy, Indian Society of Biological Sciences, and Indian Society of Forestry.

Awards and Honours: Vishwambhar Puri Gold Medal (Indian Botanical Society) (1978).

Author/Editor Facet: Authored a monograph 'Aquatic Angiosperms of India' (CSIR, 1962); contributed a chapter to the book 'Ecology and Biogeography of India'.

Died 17 April 1980.

SUDARSHAN, Ennackal Chandy George

Elected 1973

Born 16 September 1931; Pallam,Kerala
Ph.D. (1958), University of Rochester, USA; D.Sc.. (*h.c*), University of Wisconsin, USA (1969), University of Delhi (1973)

Specialization: Quantum Electrodynamics, Particle Physics

Research Achievements: Sudarshan's early work was on the nature of weak interactions. Here he discovered the Chiral V-A theory of weak interactions and enabled the next step of unification into the standard model. As a student, he made the first use of broken symmetry (with Marshak and Okubo) in formulating the sum rules for electromagnetic properties of hadrons, a discovery which was generalized into the Gell- Mann-Okubo formula. With Currie and Jordan, he formulated relativistic Hamiltonian theories of particle interactions and proved that if the particle trajectories are world lines, there can be no interaction. Did extensive work on quantum optics and proved the important theorem on the equivalence of quantum and semi-classical descriptions of optical coherence into a quantum electrodynamic framework. His work (together with Chiu and Gorini) on generalized quantum mechanics is the first example of a quantum theory with analytic continuation of the state space. Worked with Imbo on the general theory of exotic statistics for particles and excitations. To sum up, Sudarshan's work is not confined to particle physics, but has influenced statistical mechanics, quantum optics and classical mechanics.

Positions: Associate Professor, University of Rochester; Professor and Director, Research Program in Elementary Particles, Syracuse University; Professor, Center for Particle Theory, University of Texas, Austin; Senior Professor, Centre for Theoretical Studies, Indian Institute of Science, Bangalore; Professor, University of Berne, Switzerland (1964-65); Sir C.V. Raman Distinguished Visiting Professor, University of Madras (1972-73); Jubilems Professor, Chalmers University of Goeteborg, Sweden; Distinguished Visiting Scholar, Rice University of Houston, USA.

Learned and Professional Societies: Fellow, Third World Academy of Sciences, American Physical Society, and Indian Academy of Sciences; Member, International Academy of the Philosophy of Science.

Awards and Honours: Satyendranath Bose Medal (INSA) (1977); Sarvadikari Medal (University of Calcutta) (1993).

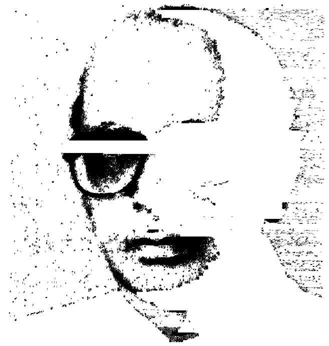
Author/Editor Facet: Authored/co-authored 'Recent Developments in Theoretical Physics' (World Scientific, 1987); edited/co-edited: 'The Past Decade in Particle

Theory' and 'Classical Dynamics'; member, editorial boards of: *J. Math. Phys.*, *J. Math. & Phys.*, *Rep. Math. Phys.*, *J. Social Biol. Structures*, and *Lett. Math. Phys.*

Address: Center for Particle Physics, University of Texas, Austin 78712-108, USA; Tel: 512-471-5229; Fax: 512-471- 9637; E-mail: sudarshan@utaphy.bitnet.

SUKH DEV

Elected 1968



Born 17 June 1923; Chakwal, Pakistan
Ph.D. (1950), Panjab University; D.Sc. (1960), Indian Institute of Science, Bangalore

Specialization: Organic Chemistry; Terpene Chemistry

Research Achievements: Sukh Dev discovered several new structural types in terpenoids; enunciated 'the absolute stereochemistry biogenetic rule'; determined the structure of lac resin; isolated and characterized kodo-milet toxins; characterized the hypolipaemic compounds of *Commiphora mukul*, which led to the development of a modern drug; discovered several new reactions with polyphosphoric acid; pioneered studies of organic reactions in a solid matrix; and introduced silver nitrate-silica gel for olefin chromatography.

Positions: INSA-S.N. Bose Research Professor, Department of Chemistry, IIT, New Delhi (1988-); Director, Malti-chem Research Centre, Baroda (1974-88); Head, Division of Organic Chemistry (Natural Products), National Chemical Laboratory, Pune (1960-74); Lecturer in Organic Chemistry, IISc, Bangalore (1953-57; 1958- 59); Research Associate, University of Illinois, Urbana, USA (1957-58); Visiting Professor, Chemistry Department, University of Georgia, USA (1969) and Chemistry Department, University of Oklahoma, USA (1970- 71); UGC Visiting Professor (1973).

Learned and Professional Societies: Fellow, Intra-Science Research Foundation, USA (1971-76), Indian Academy of Sciences, Third World Academy of Sciences; Founder Fellow, Gujarat Science Academy; President, Indian Chemical Society (1978-79); Member, INSA Council (1986-88).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1964); Acharya P.C. Ray Memorial Medal (1970); Dr. K.G. Naik Gold Medal (1977); Vishwakarma Medal (INSA) (1979); Earnest Guenther Award (American Chemical Society) (1980); IISc Distinguished Alumni Award (1980); VASVIK Award (1980); FICCI Award

(1980); Professor T.R. Seshadri 70th Birthday Commemoration Medal (INSA) (1982); Meghnad Saha Medal (INSA) (1987); Third World Academy of Sciences Award (1988); Srinivasa Ramanujan Birth Centenary Award (Indian Science Congress Association) (1992).

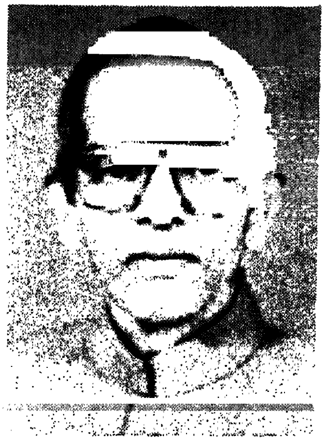
Lectureships: Professor K. Venkataraman Lecture (1970-71); Dr. Bawa Kartar Singh Memorial Lecture (Panjab University) (1975); Dr. R.C. Shah Memorial Lecture (University of Bombay) (1978); C.V. Raman Memorial Lecture, (IISc) (1980); Coochbehar Professorship Lectures (Indian Association for the Cultivation of Science) (1982); Professor B.D. Tilak Endowment Lecture (1986); Mellanby Memorial Lecture, (Central Drug Research Laboratory) (1986); Professor O.P. Vig 61st Birthday Endowment Lectures (Panjab University) (1987); CSIR Distinguished Lecture (1989); Platinum Jubilee Lecture (Indian Science Congress) (1992).

Author/Editor Facet: Authored/Co-authored 'Monoterpenoids' (2 vols), 'Diterpenoids' (4 vols), and 'Triterpenoids' (2 vols) (all by CRC Press); Member, editorial boards of: *Tetrahedron, Tetrahedron Lett., Tetrahedron Asym., Indian J. Chem. (Sec. B), Res. & Indust.*; and member, advisory board, 'Dictionary of Organic Compounds'; and of several abstracting periodicals.

Policy-making Bodies: President, Organic Chemistry Division, IUPAC (1987-89).

Address: Department of Chemistry, Indian Institute of Technology, Hauz Khas, New Delhi 110016; Tel: (011) 6862208; Res: C-600, New Friends Colony, New Delhi; Tel: (011) 6847119.

SUKHATME, Pandurang Vasudeo *Elected 1943*



Born 27 July 1911; Budh, Maharashtra
Ph.D. (1936), D.Sc. (1939), University of London, UK

Specialization: Biometry, Health and Nutrition

Research Achievements: Sukhatme developed the theory of non- sampling errors. Also made statistical designs for developing hybrid varieties. Wrote a book on World's Hunger, which helped to destroy the myth that two-thirds of the world is hungry and malnourished and showed that diet and disease are the basic components of health but between the two, the latter is more important for rural development. Also showed that behaviour of man has its origin in the mind-brain interaction under a sustained change in external environment and therefore the key to transforming man and society lies in improving communication through education with yoga as its spearhead so that man can develop into a citizen who is responsible to the society and nation at large.

Positions: Director, Statistics Division, FAO (UN) (1951-71); Statistical Adviser, Indian Council of Agricultural Research, New Delhi (1941-51); Regents' Professor, University of California, Berkeley, USA (1971-72); Research Professor, Iowa State University, USA (1951-52).

Learned and Professional Societies: Fellow, Royal Statistical Society, Hony Fellow, Statistical Societies of USA, Japan and other countries; Fellow, National Academy of Sciences (India), Indian Academy of Sciences, Maharashtra Academy of Sciences, and Indian Society for Medical Statistics; President, Indian Society of Agricultural Statistics and National Academy of Agricultural Sciences (India); Member, International Statistical Institute (Vice-President), Biometric Society (Vice-President), President, International Association of Survey Statisticians and International College of Nutrition; Member,INSA Council (1950- 51,1979)

Awards and Honours: Guy Medal (Statistical Society, London) (1963); B.C. Guha Memorial Lecture (Indian Science Congress) (1965); Lal Bahadur Shastri Memorial Lecture Award (IARI) (1977); B.D. Tilak Lecture Award (INSA) (1983); Hari Om Ashram Trust Award (UGC); Padma Bhushan (1973).

Author/Editor Facet: Authored six books including 'Sampling Theory of Surveys with Applications' (1954) and 'The World's Hunger and Future Needs in Food Supplies' (Royal Statistical Society, London, 1961); edited 'Newer Concepts in Nutrition and Their Implications for Policy' (Maharashtra Association for the Cultivation of Science, 1982).

Other Contributions: Sukhatme has shown that the rural areas in the country primarily suffer not so much from lack of food as from morbidity resulting from lack of essential living conditions. His second contribution is showing through projects like Indira Community kitchen how the poor can help the poor to provide food for all on no-profit no-loss basis.

Address: 'Sankhyadarshan', 64/12, Erandawana, Pune 411 004 Tel: (0212) 330723.

SUKHESWALA, Ratan Nadirshaw

Elected 1978

Born 1 December 1910; Balsar, Gujarat
Ph.D. (1938), University of Bombay

Specialization: Geology

Research Achievements: Sukheswala worked on the Deccan Trap rocks. He was the first to discover carbonatite alkaline rocks in India.

Positions: Professor Emeritus, Professor and Head, Geology Department, St Xavier's College, Bombay.

Learned and Professional Societies: Fellow, Geological Society of India, Indian Society of Earth Sciences, Geological, Mining and Metallurgical Society of India (sometime Vice-President), Earth Science Society of India (sometime President), and Maharashtra Academy of Sciences.

Awards and Honours: Pramatha Nath Bose Memorial Medal (Asiatic Society) (1978).

Policy-making Bodies: Corresponding Member, Subcommission on Systematics of Igneous Rocks, IUGS; Member, Indian National Committee for International Geological Correlation Programme.

Died 3 June 1992.

SULAIMAN, Sir Shah Muhammad

Elected 1937

Born 3 February 1886; Jaunpur, Uttar Pradesh
Maths Tripos (1909), University of Cambridge, UK;
LL.D. (1911), University of Dublin, Ireland

Specialization: Theoretical Physics

Research Achievements: Sulaiman was a versatile man, distinguishing himself in law, science and education at the same time. His great zest, perseverance and dedication to mathematical physics was well known. A staunch critic of Einstein's theory of relativity, Sulaiman propounded an alternative theory, essentially classical (Newtonian) in spirit, which was characterized by Shapley as one of the highlights of astronomy during 1934. Sulaiman totally rejected the wave-particle duality. In order to prove his theory, he made some assumptions. His other major contribution was the explanation of the variation in red- shifts observed across the solar disc. His conclusion was confirmed by an expedition under T. Royds, Director of Kodaikanal Observatory.

Positions: Chief Justice, Allahabad High Court (1932); Justice, Federal Court of India (1937-41).

Learned and Professional Societies: President, National Academy of Sciences, India (1938-40); Member, British Association for the Advancement of Science and Calcutta Mathematical Society (sometime Vice-President).

Award and Honours: Hony Vice-Chancellor, Aligarh Muslim University (1929-31, 1938-41); Knighted (1929).

Died 12 March 1941.

SUNDARAM, Chokkanathapuram Venkataraman *Elected 1979*

Born 7 November 1929; Ottappalam,Kerala
D.I.I.Sc. (Metallurgy) (1952), Indian Institute of Science, Bangalore

Specialization: Extractive Metallurgy of Rare Metals; Special Materials Development

Research Achievements: Sundaram was responsible for the development of the extractive metallurgy of zirconium from laboratory through pilot plant to production scale, for application in nuclear power reactors; and development of detailed flowsheets for producing titanium, beryllium, niobium and tantalum. Was associated with the first phase of the commissioning of the sodium-cooled, plutonium-fuelled fast breeder test reactor at Kalpakkam.

Positions: Homi Bhabha Visiting Professor, National Institute of Advanced Studies, Bangalore (1991-); Director, Indira Gandhi Centre for Atomic Research, Kalpakkam (1982-89); Head, Metallurgy Division, Bhabha Atomic Research Centre, Bombay (1975-82).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Indian National Academy of Engineering; Hony Member, Indian Institute of Metals (IIM); Member, Metallurgical Society (USA).

Awards and Honours: Kamani Gold Medal (Indian Institute of Metals) (IIM); National Metallurgists' Day Award (1970); VASVIK Award (1980); Platinum Medal (IIM) (1985); Platinum Jubilee Distinguished Alumnus Award (IISc) (1985); Sanjay Gandhi Award (1985); Syed Husain Zaheer Medal (INSA) (1985- 86); Padma Bhushan (1986).

Lectureships: N.P. Gandhi Memorial Lecture, Indian Institute of Metals.

Author/Editor Facet: Served as chief editor of *Trans. Indian Inst. Metals* (1972-80) and *Metals, Mater. Process.* (1989-); Member, editorial advisory board, *J. Nucl. Mater.*

Policy-making Bodies: Chairman, DST Programme Advisory Committee on Materials, Minerals and Mineral Engineering (1991-) and Research Council, Regional Research Laboratory, Bhubaneshwar.

Other Contributions: Sundaram is interested in the history of Indian Metallurgy, a subject on which he has lectured extensively.

Address: Homi Bhabha Visiting Professor, National Institute of Advanced Studies, Indian Institute of Science Campus, Bangalore 560 012; Tel: (080) 346594,346634; Fax: 91-80- 346634; E- mail:niasrlk@nias.iisc.ernet.in.

SUNDARAM, Krishna

Elected 1975

Born 12 November 1926; Kollengode, Kerala
M.D. (1953), University of Bombay

Specialization: Radiation Biology, Genotoxicology and Cancer Immunology

Research Achievements: Sundaram studied mammalian radiobiology, immunology, cancerology and radiation medicine. His work on the etiological factors associated with toxaemia of pregnancy implicating mineralocorticoids, later identified as aldosterone, a causative factor in fluid retention and hypertension, has received international recognition. He was perhaps the first scientist in the country to apply exfoliative cytology techniques in the diagnosis of cancer and prognosis in radiotherapy. His original work on the predisposing factors in the development of oral cancer in experimental animals highlighted the importance of nutritional deficiencies of protein and B group vitamins in the etiology. Demonstrated in experimental animals that developing gonads are very highly sensitive to radiation damage leading to permanent sterility. Showed, for the first time, the inter- relationship between radiation sensitivity and cancer development and that though radioprotective chemicals can reduce immediate mortality, the risk of those survivors to the development of cancer is enhanced. These observations are of great importance to the current concepts of chemical radiation protection and the somatic mutation theory in carcinogenesis. He has also studied the basic mechanism in immunology, especially in cell-mediated immunity.

Positions: Director, Bio-Medical Group, Bhabha Atomic Research Centre, Bombay.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Maharashtra Academy of Sciences; Member, INSA Council (1976-78).

Awards and Honours: Prince of Wales Gold Medal and Fellowship (University of Bombay) (1953).

Address: Director, Bio-Medical Group, Bhabha Atomic Research Centre, Trombay, Bombay 400 085; Tel: (022) 5516165; Res: 38, Lake Shore Manor, Gangadhara Shetty Road, Bangalore 560 042; Tel: (080) 8224031.

SUNDARARAJ, B. *Elected 1935*

Ph.D. (1923); University of Liverpool,UK

Specialization: Zoology, Fisheries

Research Achievements: Sundararaj was an authority on the development of fisheries in India. He was responsible for organizing several surveys and establishment of fisheries.

s: Director of Fisheries, Madras; Fisheries Advisor, Socio-economic Division, Department of Fisheries, Sri Lanka.

Learned and Professional Societies: Member/Fellow, Asiatic Society, Indian Academy of Sciences, British Association for the Advancement of Science, and Zoological Society of India.

Awards and Honours: President, Zoology Section, Indian Science Congress (1928).

Died 22 January 1974.

SUNDARARAJ, Bangalore Inamti *Elected 1974*

Born 29 January 1932; Madurai, Tamil Nadu
Ph.D. (1958), University of Mysore; Ph.D. (1960), Tulane

Specialization: Zoology, Endocrinology

Research Achievements: Sundararaj investigated the environmental and endocrine regulation of most aspects of reproduction on the catfish, *Heteropneustes fossilis*. As a result, catfish is considered to be one of the most comprehensively studied teleost fish models in the world. His work is not only basic but has applications in aquaculture.

Positions: Professor, Department of Zoology, University of Delhi, Delhi.

Learned and Professional Societies: Member, European Society for Comparative Endocrinology, American Society of Zoologists, American Association of Anatomists, American Fisheries Society, and International Society of Chronobiology.

Awards and Honours: Full Member, Tulane Chapter, Sigma Xi (1959); Rafi Ahmed Kidwai Memorial Prize (1974-75); UGC National Lecturer (1978-79); S.L. Hora Memorial Medal (Indian Society of Ichthyologists) (1981).

Author/Editor Facet: Member, editorial boards of: *Chronobiol.* and *Gen. Comp. Endocrinol.*

Died 7 October 1983.

SUR, Nalini Kanta

Elected 1938

Born 24 August 1892; Gorakhpur, Uttar Pradesh
D.Sc. (1927), University of Allahabad

Specialization: Optics, Meteorology

Research Achievements: Sur worked on problems in physical optics as laminar diffraction, scattering of light by smoky quartz, departure from Fernel's laws of reflection, etc. He made notable contributions to meteorology and exploration.

Positions: Meteorologist, Class I, Upper Air Observatory, Agra, and Superintending Meteorologist, Meteorological Office, Pune (1927-46); Head, Department of Meteorology, Oceanography and Exploration Geophysics, Andhra University, Waltair.

Learned and Professional Societies: Fellow, National Academy of Sciences (India); Member, INSA Council (1941-43).

Other Contributions: Sur was largely responsible for starting Geophysics Department, Meteorology and Oceanography Department and Geophysics (Exploration) Department in Andhra University.

Died 2 July 1981.

SURANGE, Krishna Rajaram

Elected 1970

Born 7 February 1920; Ujjain, Madhya Pradesh
Ph.D. (1948), University of Cambridge, UK

Specialization: Palaeobotany

Research Achievements: Surange has done morphological studies on two genera of the small South-American family- Cyclanthaceae and its fossil counterpart in India; worked on Coenopterid ferns (Lower Carboniferous)-*Botryopteris* and *Stauropteris*. Discovered heterospory in *Stauropteris burntislandica*, one of the earliest fern-like plants. Carried out detailed studies on the male and female reproductive organs of *Glossopteris* complex, and on the venation pattern of type species of Indian *Glossopteris*.

Positions: Director, MACS Research Institute, Pune (now Agharkar Research Institute) (1980-85); Director, Birbal Sahni Institute of Palaeobotany, Lucknow (1959-80).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Maharashtra Academy of Sciences, and Palaebotanical Society of India.

Awards and Honours: Birbal Sahni Medal (Indian Botanical Society) (1979).

Author/Editor Facet: Authored a monograph 'Indian Fossil Pteridophytes'; chief editor, *Palaeobotany*. (till 1990).

Policy-making Bodies: Member, Executive Committee, The World Organization of Palaeobotany; Member, International Committee for Palaeobotanical Nomenclature; Chairman, Working Group in Palaeobotany and Palynology of IUGS Subcommission on Gondwana Stratigraphy (till 1982).

Address: B-20, Sector A, Mahanagar, Lucknow 226 006; Tel: (0522) 72594.

SUROLIA, Avadhesha

Elected 1990

Born 3 December 1947; Kishangarh, Rajasthan
Ph.D. (1976), University of Madras

Specialization: Cell-surface Carbohydrates, Protein Sugar Interaction, Protein and Carbohydrate Chemistry, Structure and Function, Model Membranes, Spectroscopy, Immunology

Research Achievements: Surolia discovered glycolipids as biological receptors; discovered antitumour and blood group specific lectins; developed cell- and tissue-specific drug targeting, developed protein-protein monoconjugation for immunoassays and tissue-specific drug targeting. Defined the nature of forces in protein-sugar interactions and the dynamics involved therein. Elucidated lectin structure and function.

Positions: Professor, Molecular Biophysics Unit (1991-), Visiting Professor, ASTRA Research Centre (1988-89), Associate Professor (1986-91) and Assistant Professor, Molecular Biophysics Unit (1981-86), all at Indian Institute of Science, Bangalore (1981- 86); Scientist, Indian Institute of Chemical Biology, Calcutta (1977-81).

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Member, Society of Biological Chemists (India).

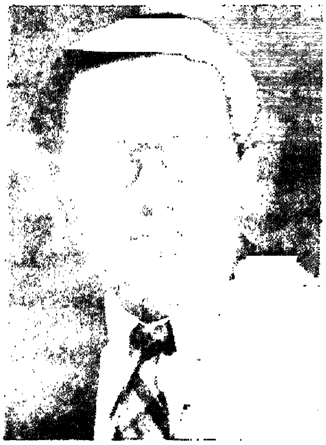
Awards and Honours: W.H. Stillmark International Prize (1990); Shanti Swarup Bhatnagar Prize (1987); M. Sreenivasaya Memorial Award (Society of Biological Chemists, India) (1982); VASVIK Award (1980); INSA Young Scientists Medal (1976); Kothari Scientific Research Institute Prize; Dr. C.S. Patel Gold Medal (M.S. University of Baroda) (1978); Elected to Guha Research Conference (1980).

Address: Professor, Molecular Biophysics Unit, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2389); Telex: 0845-8349 IISc IN; Fax: 91-80-341683; E-mail: as@mbu.iisc.ernet.in; Res: 62 (First Floor), Third Main, Malleswaram, Bangalore 560 055.

SUXENA, Mahendra Raj

Elected 1971

Born 18 January 1914
Ph.D. (1950), University of London, UK



Specialization: Hydrobiology, Systematics of Algae (Diatoms, Desmids) and Rhizopoda (Testacea)

Research Achievements: Suxena's contributions relate to: hydrobiology, ecology of algae, systematics of grasses, economic and medicinal plants, systematics of diatoms, desmids and testacea. He has also done much work on the history of botany.

Positions: Emeritus Professor, Professor and Head, Department of Botany and Dean, Faculty of Science, Osmania University, Hyderabad.

Learned and Professional Societies: Fellow, Andhra Pradesh Academy of Sciences; (sometime President), Indian Botanical Society.

Awards and Honours: Professor Sayeeduddin Gold Medal and Diamond Jubilee Award (Osmania University) (1978-79); Silver Jubilee Award (Andhra Pradesh Academy of Sciences) (1979).

Address: Emeritus Professor Botany Department, Osmania University, Hyderabad 500 007 (A.P.); Res: 6-2-966/6, Hill Colony, Khairtabad, Hyderabad 500 004; Tel: (0842) 223254.

SWAMINATHAN, Mahadeva

Elected 1960

Born 1 June 1912; Maharajapuram, Tamil Nadu
D.Sc. (1940), University of Madras

Specialization: Nutrition & Food Biochemistry

Research Achievements: Swaminathan has developed chemical methods for the determination of niacin and worked on several aspects of nutrition and dietetics. His achievements relate to: (i) infant and protein foods, (ii) mutual and amino acid supplementation of proteins, and (iii) metabolism studies in children.

Positions: Emeritus Scientist, Chairman, Applied Nutrition and Dietetics (1949-72), Central Food Technological Research Institute, Mysore.

Learned and Professional Societies: Fellow, National Academy of Sciences (India); Hony Member, American Institute of Nutrition.

Author/Editor Facet: Authored: 'Essentials of Food and Nutrition', 'Handbook of Food and Nutrition', 'Food Science and Experimental Food' and 'Biochemistry for Medical Students'; served as associate editor, *Nutrit. Rep. Internat.*

Policy-making Bodies: Member, FAO/WHO Expert Group on Calcium Requirements (1961).

Address: C/o, Meenakshi Clinic, 29-B, Sivajinagar, Thanjavur 613 001, Tamil Nadu.

SWAMINATHAN, Monkombu Sambasivan *Elected 1963*

Born 7 August 1925; Kumbakonam, Tamil Nadu
Ph.D. (1952), University of Cambridge, UK; D.Sc. *(h.c.)* from 33 universities in India, Thailand, Philippines, Italy, Germany, The Netherlands and USA.

Specialization: Genetics, Cytogenetics, Plant Breeding, Sustainable Agriculture

Research Achievements: Swaminathan's early researches (1947- 60) included the elucidation of the origin and differentiation of cultivated potato (*Solanum tuberosum* Linn.), cytogenetic interrelationships among *Triticum* spp, induction of mutations for qualitative and polygenic traits in wheat, methodologies for detecting and assessing indirect effects of radiations with particular reference to the nutritional safety of irradiated foods. His later researches (1960-80) had as their main focus the conservation of biological diversity with particular reference to rice and wheat, modification of plant architecture and growth rythm for raising yield ceilings in wheat and rice and the development of crop production strategies which can lead to higher yields per unit by land, water, energy and time. Recent researches (1980-93) relate to rice breeding and biotechnology, impact of climate change on crop productivity and the conservation of coastal biodiversity with particular reference to mangrove ecosystems.

Positions: Director General, International Rice Research Institute, Philippines (1982-88); Member, Agriculture and Science, Planning Commission (1980-82) ; Principal Secretary, Ministry of Agriculture (1979-80); Director General, ICAR, and Secretary, Department of Agricultural Research and Education (1972-79); Director, Indian Agricultural Research Institute, New Delhi (1966-72).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Royal Society of London; President, Indian Science Congress (1976); Foreign

Associate, National Academy of Sciences (USA); Foreign Member, Russian Academy of Agricultural Sciences; Founding Fellow, Third World Academy of Sciences, National Academy of Sciences, India (President, 1980-90), and National Academy of Agricultural Sciences, India (President 1991-); Member, Council (1967-68) and Secretary (1969-72), INSA.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1961); Birbal Sahni Medal (Indian Botanical Society) (1966); Silver Jubilee Commemoration Medal (INSA) (1971); Barclay Medal (Asiatic Society) (1978); K.L. Moudgill Prize (1978); UGC National Lecturer (1979); Borlaug Award (1979); Meghnad Saha Medal (INSA) (1981); R.D Misra Medal (Indian Environmental Society) (1981); Dr. J.C Bose Medal (Bose Institute) (1989); Jawaharlal Nehru Birth Centenary Award (ISCA) (1992); Mendel Memorial Award (Czechoslovak Academy of Sciences); Bicentenary Medal (University of Georgia) (1985); Albert Einstein World Science Award (1986); First World Food Prize (Smithsonian Institution) (1987); The Golden Heart Presidential Award (Philippines) (1987); Tyler Prize for Environmental Achievement; Padma Vibhushan (1989).

Lectureships: P.M.S. Blackett Memorial Lecture (INSA-Royal Society) (1982).

Author/Editor Facet: Authored/co-authored several books including 'Science and the Conquest of Hunger' (1983), and edited/co-edited a large number of books and monographs.

Policy-making Bodies: Chairman, Science Advisory Committee to the Cabinet and National Biotechnology Board (1980-82), UN Advisory Committee on Science and Technology for Development (1981-84); President, IUCN (1984-90) and of several international bodies.

Other Contributions: Swaminathan has been addressing the task of taking the benefits of scientific research to resource poor farming families and for the promotion of science and its application for public good.

Address: M.S. Swaminathan Research Foundation, 3rd Cross, Tharamani Institutional Area, Madras 600 113; Tel.: (044) 2351229; Telex: 91-41-5119 SARD IN; Fax: 91-44- 410031; Res: 11, Rathna Nagar, Teynampet, Madras 600 018; Tel: (044) 455339.

SWAMINATHAN, Sambasiva

Elected 1978

Born 20 April 1923; Madras, Tamil Nadu
Ph.D. (1949), University of Illinois, USA

Specialization: Organic Chemistry - Synthetic and Applied

Research Achievements: Swaminathan has contributed to (a) synthetic approaches to nonaromatic steroids; (b) molecular rearrangements; and (c) chemistry of indoles and thienopyrroles. He discovered a novel molelcular rearrangement leading to a two- carbon ring expansion.

Positions: Professor Emeritus, Professor, Department of Organic Chemistry, University of Madras.

Learned and Professional Societies: Fellow, Indian Academy of Sciences,.Chemical Society (London) and Tamil Nadu Academy of Sciences; Member, Sigma Xi; President, Madras Science Association.

Awards and Honours: Dr. T.R. Govindachari Award (1980).

INSA has instituted 'Professor S.Swaminathan 60th Birthday Commemoration Lecture Award' to honour him.

Address: Emeritus Professor, Department of Organic Chemistry, University of Madras 600 025; Tel: (044) 2351269; Res: 23 XII Cross Street, Shastrinagar, Madras 600 020; Tel: (044) 411858.

SWARUP, Govind

Elected 1975

Born 23 March 1929; Thakurdwara, Uttar Pradesh
Ph.D. (1961), Stanford University, USA; D.Sc. (Engng) *(h.c.)* (1987), University of Roorkee

Specialization: Radio Astronomy - Solar Radio Emission, Interplanetary Scintillations, Extragalactic Radio Sources, Cosmology and Radio Astronomy Instrumentation

Research Achievements: Swarup discovered Type-U solar radio burst. Set up at Ooty a 530 x 30m cylindrical Radio Telescope of a unique design. Obtained independent evidence for the Big Bang evolutionary model through an angular-size flux-density relation for extragalactic radio sources. Set up the Giant Metrewave Radio Telescope (GMRT) with 30 antennas of 45 m dia, using a novel and economical design concept.

Positions: Professor of Eminence and Director, GMRT Project, (1990-); Reader, Associate Professor, Senior Professor, all at Tata Institute of Fundamental Research, Bombay (1963- 1990); Assistant Professor, Stanford University, USA (1961- 63); Visiting Professor, University of Maryland, Groningen, and Leiden (1980- 81).

Learned and Professional Societies: Fellow, The Royal Society, London, Indian Academy of Sciences, National Academy of Sciences (India), Indian Geophysical Union, and Third World Academy of Sciences; Associate, Royal Astronomical Society (London); Member, Astronomical Society of India (President 1975-77); International Astronomical Union (IAU) (President, Commission. on Radio Astronomy, 1979-82) Indian Physical Society; Life Member, Indian Physics Association; Member, INSA Council (1985).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1973); Jawaharlal Nehru Fellowship (1974); P.C. Mahalanobis Medal (INSA) (1984); Biren Roy Trust Medal (Indian Physics Society) (1986); INSA-Vainu Bappu Memorial Award (1987); Tskolovosky Medal (Federation of Cosmonautics, USSR) (1987); Meghnad Saha Medal (National Academy of Sciences, India) (1987); Third World Academy of Sciences Award (1988); John Howard Delinger Gold Medal (URSI) (1990); Rameshwar Dasji Birla Award (1990); FIE Foundation Award (1991); C.V. Raman Medal (INSA) (1993); Padma Shri (1972).

Author/Editor Facet: Co-edited two books 'Quasars' and 'History of Oriental Astronomy'; served as editorial board member of: *Indian J. Radio & Space Phys.*, *J. Nat. Acad. Sci.* (India)

ing Bodies: Representative of IAU on COSTED; Member, Executive Committee (IUCAF).

Other Contributions: Swarup has been instrumental in establishing an antenna industry in India, starting from the Kalyan Radio Telescope, the Ooty Radio Telescope and now the GMRT. The know-how developed at TIFR had been transferred to ECIL and antennas worth over Rs.150 crores have been built in India.

Address: National Centre for Radio Astrophysics, University of Poona Campus, Post Bag 3, Ganeshkhind P.O., Pune 411 007; Tel: (0212) 336111; Telex: 0145-7658 GMRT IN; Fax: 91-212-345149; E- mail:gswarup@gmrt.ernet.in; Res: 'Surya' NCRA-TIFR Colony, University of Poona Campus, Ganeshkhind, Pune 411 007; Tel: (0212) 336100.

SWARUP, Krishna

Elected 1985

Born 24 July 1927; Basti,Uttar Pradesh
D.Phil. (1957), University of Allahabad

Specialization: Fishery Biology, Comparative Vertebrate Endocrinology and Limnology

Research Achievements: Swarup established, contrary to earlier belief, that vitamin D is involved in calcium metabolism in fishes. This work is being continued. His current research relates to neuroendocrine system in lungs of reptiles, about which little is known.

Positions: Professor and Head, Department of Zoology, University of Gorakhpur, Gorakhpur; CSIR Emeritus Scientist.

Learned and Professional Societies: Fellow, National Academy of Sciences (India).

Author/Editor Facet: Served as chief editor, *Proc. Nat. Acad. Sci. India (Sec. B)* (1985-92).

Other Contributions: Swarup established a School of Comparative Endocrinology in the Department of Zoology, University of Gorakhpur, which has gained international recognition.

Address: Professor, The National Academy of Sciences India, 5 Lajpatrai Road, Allahabad 211 002; Tel: (0532) 640224 (Off); (0532) 622945 (Res).

TAKKAR, Pran Nath

Elected 1989

Born 5 May 1940; Raiwind, Pakistan
Ph.D. (1966), Punjab Agricultural University, Ludhiana

Specialization: Agriculture, Soil Science (Soil Chemistry and Fertility)

Research Achievements: Takkar developed and standardized chemical and biochemical soil and plant tests which predict, reliably, nutrient deficiencies under different soil-crop situations. Characterized visual deficiency symptoms of micronutrients and identified their deficient areas. Developed technology that effectively correct Zn, Fe, Mn, S, N and P deficiency in a large number of crops and soil cropping systems. Characterized nutrient, kinetic, adsorptions, desorptions and interaction reactions. Developed a strong school of research on micronutrients in soils and plants.

Positions: Director, Indian Institute of Soil Science, Bhopal (1988-); Assistant Professor of Soils (1967), Soil Chemist (1970-76), Senior Soil Scientist (1976-88) and Project Coordinator, All India Coordinated Scheme on Micro and Secondary Nutrients in Soils and Plants (ICAR), Punjab Agricultural University, Ludhiana.

Learned and Professional Societies: Fellow, Indian Society of Soil Science and National Academy of Agricultural Sciences (India).

Awards and Honours: Silver Jubilee Award of Excellence (Fertilizer Association of India) (1985); XII International Soil Science Congress Commemoration Award (1986); Hari Om Ashram Trust Award (ICAR) (1987-88).

Lectureships: N.R. Dhar Memorial Lecture (University of Allahabad) (1990).

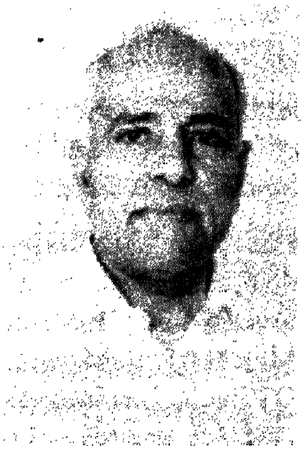
Author/Editor Facet: Co-authored 'Nutritional Disorders of Grain Sorghum' (Australian Centre for International Agricultural Research, ICAR and University of Queensland, 1989); and contributed 4 chapters in books.

Policy-making Bodies: Member, International Council for Genetic and Molecular Biology of Plant Nutrition; Councillor, Indian Society of Soil Science (1985-87); Adviser, Madhya Pradesh Council of Science and Technology (1991-).

Address: Director, Indian Institute of Soil Science, Z-6, Zone-I, Maharana Pratap Nagar, Bhopal 462 011; Tel: (0755) 553546; Gram: SOILINST.Bhopal; Fax: 91 (755) 553546; Res.: 2/8 HIG(B), Ranthambore Complex, Zone-II, Maharana Pratap Nagar, Bhopal 462 011; Tel: (0755) 556196.

TALWAR, Gursaran Prashad

Elected 1974



Born 2 October 1926, Hisar, Haryana
Docteur es Sciences (1953), Sorbonne University, Paris

Specialization: Immunology, Reproductive Biology, Biochemistry

Research Achievements: Originator of the concept of immuno- contraception, Talwar has developed a number of vaccines for control of human and animal fertility. An injectible for sterilizing male animals without loss of libido and decline in testosterone has received New Drug Authorization. The hCG vaccine is the first birth control vaccine whose ability to prevent pregnancy in women was demonstrated in phase II trials. A semi- synthetic vaccine against LHRH is in clinical trials in carcinoma of prostate patients. Extracts from neem *(Azadirachta indica)* stimulating locally cell-mediated immunity form the basis of two novel vaccines for control of male and female fertility. He has also developed a vaccine against leprosy with remarkable immunotherapeutic properties. Developed simple-to-use and accurate immunodiagnostic kits for pregnancy, amoebiasis, typhoid and strep A. Earlier he made seminal contributions to our understanding of the mechanism of action of growth hormone and estradiol.

Positions: Professor of Eminence (1991-), Founder Director (1983-91), National Institute of Immunology, New Delhi; Professor and Head, Department of Biochemistry, All India Institute of Medical Sciences, New Delhi (1965-83); Head, ICMR-WHO Research & Training Centre in Immunology.

Learned and Professional Societies: Fellow, National Academy of Medical Sciences (India), National Academy of Sciences (India), Indian Academy of Sciences, Royal College of Obstetricians and Gynaecologists (London), *ad eundem*; President, Indian Immunological Society (2 terms, 1973-77), Endocrine Society of India (1978), Indian College of Allergy & Applied Immunology (1979), Association of Clinical Biochemists of India (1982).

Awards and Honours: National Award in Bio-Medicine (Ministry of Health and Family Planning) (1969-70); Basanti Devi Amirchand Senior Prize (ICMR) (1972);

UGC National Lecturer (1975); Acharya J.C. Bose Oration (1976); FICCI Award (1977); Sunder Lal Hora Medal (INSA) (1978); Sir J.C. Bose Award (Hari Om Ashram Trust- UGC) (1978); Jalma Trust Prize in Leprosy (ICMR) (1979); Jawaharlal Nehru Fellowship (1979- 1981); Rameshwardas Birla Smarak Kosh National Award (1982); Fogarty Scholar-in-Residence (National Institutes of Health, USA) (1982-85); Ranbaxy Research Award (1990); Officer de la Legion d'Honneur, France (1991); Padma Bhushan (1992).

Lectureships: Ayerst Lecture (Pacific Coast Fertility Society, USA) (1978); Founder Memorial Lecture (Shriram Institute for Industrial Research) (1983); Philip R. White Memorial Oration (1989); Glaxo Oration (1985); Mellanby Oration (1989), LUPIN-TAI Oration (1991).

Author/Editor Facet: Authored/edited some 15 books; member, editorial boards of 8 journals/serials including *J. Clin. Immunol., Proc. Roy. Soc., Lond. (Ser. B), and Indian J. Biochem. Biophys.*; series editor; *Prog. Vaccinol.*

Policy-making Bodies: Chairman, National Committee for IUIS (2 terms); President, Federation of Immunological Societies of Asia- Oceania (1992-) and International Society for Immunology of Reproduction (1992-95); Executive Committee Member, International Coordination Committee for Immunology of Reproduction (1976-); International Network for Molecular & Cell Biology, Unesco, Paris (1989-); and several other international bodies.

Address: Professor of Eminence, National Institute of Immunology, Aruna Asaf Ali Marg, New Delhi 110 067;,Tel: (011) 662608; Telex: 031-73383; Fax: 91-11-6862125; Res: Neemtree House, NII Campus, New Delhi 110 067; Tel: (011) 662330, 664419.

TANDON, Badri Nath

Elected 1989

Born 1 August 1931; Khairabad, Uttar Pradesh
M.D. (1961), University of Lucknow

Specialization: Liver, Gastroenterology and Human Nutrition

Research Achievements: Tandon's major achievements relate to: characterization of ulcerative colitis and its differentiation from infectious inflammatory bowel diseases in India; adverse effects of protein-calorie malnutrition on intestine, pancreas and liver and their reversibility by dietary management; etiopathogenic role of intestinal parasites in idiopathic tropical malabsorption syndrome; epidemic of toxic liver injury due to natural food toxins, their identification and management; epidemiology of hepatitis B virus infection in India and policy for HBV immunization; epidemics of viral hepatitis in India and the isolation of the etiological agent labelled as hepatitis E virus; identification of subacute hepatic failure - a new clinical entity and its successful management with drugs from herbal plants; and epidemiology of hepatitis C virus in India. With regard to human nutrition, he has developed several innovative approaches, which are being implemented for mother care and child development.

Positions: Chairman, Central Technical Committee, ICDS, Ministry of Human Resource Development, Department of Women & Child Development, New Delhi and Hony Director, Institute of Digestive and Renal Diseases, New Delhi (1991-); Dean (1989- 90), Professor of Medicine and Head, Department of Gastroenterology and Human Nutrition (1971-91), Associate Professor of Medicine (1967-71), Assistant Professor of Medicine (1962-67), all at All India Institute of Medical Sciences, New Delhi.

Learned and Professional Societies: Fellow, National Academy of Medical Sciences (India), Indian Academy of Pediatrics, Indian Association of Preventive & Social Medicine, and Indian Public Health Association; President-Elect, International Association for Study of the Liver; President (sometime), Asian Pacific Association for study of Liver and Indian Society of Gastroenterology.

Awards and Honours: Sasakawa Health Prize (WHO) (1990); Padma Bhushan (1986).

Lectureships: Professor Om Prakash Memorial Oration; Warner Oration (Indian Society of Gastroenterology); Dr S.K. Majumdar Memorial Oration; Dr S.G. Srikantia Memorial Oration; Dr D.V. Dutta Memorial Oration.

Author/Editor Facet: Authored/coauthored 3 books and contributed chapters to at least 10 books; editor, *Trop. Gastroenterol.* and *Asian Pacific J. Gastroenterol. Hepatol.*; member, editorial boards of: *J. Clin. Gastroenterol.*, *European J. Hepatol.*, *Gastroenterol. Int.* and *Hepatol. Commun.*

Policy-making Bodies: Vice-President, World Organization of Gastroenterology; Chairman, Central Technical Committee for Health and Nutrition, Integrated Child Development Services (CTC- ICDS); Consultant, WHO, UNICEF and Planning Commission; and of several other scientific policy-making bodies.

Other Contributions: Tandon is responsible for the establishment of operational research for national programmes by more than 130 faculty members of about 90 medical colleges in India, as also for the development of research policy for gastroenterology and liver diseases.

Address: Chairman, Central Technical Committee, ICDS, Ministry of Human Resource Development, Department of Women & Child Development, West Block No. 1, Wing 3, IIFI, R.K. Puram, Post Bag No. 16, New Delhi 110 066; Tel: (011) 608166, 604923 (Off); Fax: 91-11- 6441711; Res: 'Rukmani', A-2, Sector-26, NOIDA 201301 (U.P.); Tel: 8956097, 8956098.

TANDON, Harcharan Das

Elected 1985

Born 7 October 1924
M.D. (1955), Agra University; F.R.C.Path. (1979), London

Specialization: Pathology

Research Achievements: Tandon's most significant contributions are: (i) discovery and description of the first known human outbreak of liver disease caused by aflatoxicosis in Rajasthan; (ii) discovery, description and follow-up studies of two large- scale outbreaks of veno-occlusive disease due to consumption of toxic alkoids in the seeds of wild plants - one in Afghanistan and the other in Madhya Pradesh (the first reports of such outbreaks from Asia, the former being the largest report in the world); (iii) evidence of diffuse parenchymal disease in nonsuppurative amoebic hepatitis which, explains the cause of heapatomegaly; (iv) description of the pathology of intestinal tuberculosis and its distinguishing features from Crohr's disease; (v) report on the presence of grade III and grade IV changes of pulmono hypertension accompanying congenital heart disease; (vi) description of diffuse intimal thickening of aorta as a variant of human atherosclerotic lesion; and (vii) experimental evidence that severe protein deprivation aggravates experimentally induced atherosclerosis in the pig.

Positions: Director, All India Institute of Medical Sciences, New Delhi; Visiting Professor, St Mark's Hospital, London, University of Bonn, Dusseldorf, Hamburg and West Berlin (1966, 1968), University of Kabul (1978), Garyounis University, Benghari, Libya (1981).

Learned and Professional Societies: Member, Indian Association of Pathologists and Microbiologists, Indian Medical Association , Indian Association for the Advancement of Medical Education, American Association of Pathologists and Bacteriologists, Pathologic Society of Great Britain and Ireland and International Academy of Pathology; President, National Academy of Medical Sciences (India).

Awards and Honours: Ambo-Pashpati Nath Wahi Memorial Award (1977); Mrs. S.K. Lal Memorial Award (1977); Dr. B.C Roy Memorial Award (1980).

Lectureships: Warner Oration (Indian Society of Gastroenterology) (1978); K.N Rao Endowment Oration Award (1980); Glaxo Oration Award (1980).

Policy-making Bodies: President, National Board of Examinations; Consultant to WHO on Medical Education (1973, 1974); Member, WHO Task Force on Environmental Health Criteria for Mycotoxins (1978), Expert Group on Cardiovascular Diseases (ICMR) (1969-72), and Pathology of the Armed Forces Medical Research Committee (1974); Chairman, Expert Group on Pathology (ICMR) (1972-74).

Address: B 7/8, Safdarjung Enclave, New Delhi 110 029; Tel: (011) 5712875 (Off); (011) 609750 (Res).

TANDON, Prakash Narain

Elected 1979

Born 13 August 1928; Shimla, Himachal Pradesh
M.B.B.S. (1950), M.S. (1952), University of Lucknow; F.R.C.S. (1956), England

Specialization: Neurosurgery

Research Achievements: Tandon's researches deal primarily with problems of immediate and direct relevance to the health needs of the country. His initial researches were concerned with the delineation of the pattern of neurological diseases in India. He described new syndromes, for the first time, as also the variations in the manifestations of the well-known disorders. These led to a series of monographs on tuberculosis of the central nervous system, epilepsy in India and subarachnoid haemorrhage (standard references in these fields), head injury, its epidemiology, etiology, problems of diagnosis, delineation of special syndromes and their treatment and prognosis. His group established the significance of temporal lobe lesions, pathogenesis of growing fracture skull, and clinico-pathological profiles of brain stem haemorrhages on the basis of the largest series of such cases reported from anywhere in the world. He also carried out neuro-nuclear, neuropathological, neuroendocrinological and immunohistochemical investigations to study a variety of brain tumours. In more recent years he has focused on more basic subjects like experimental neural transplantations in rodents and subhuman primates, which have for the first time revealed the phenomenon of premature ageing and progressive degeneration of transplanted neurons.

Positions: S.S. Bhatnagar Fellow (1990-), Professor of Neurosurgery, All India Institute of Medical Sciences, New Delhi (1965-); Professor of Neurosurgery, K.G. Medical College, Lucknow (1963-65); Visiting Professor, University of Oslo, Norway, University of Virginia, USA, Universities of Tripoli, and Garyounis Libya, University of Torino, Italy, PGIMER, Chandigarh, JIPMER, Pondicherry.

Learned and Professional Societies: Fellow, Third World Academy of Sciences, National Academy of Medical Sciences, India (Vice- President, 1979), National Academy of Sciences, India (Vice- President 1989-90), Indian Academy of Sciences and Royal Society of Medicine (London); Member, Academia Eurasiana Neurochirurgica, Norwegian Academy of Science, Academy of Neuroscience, Neurological Society of India, Sushrusta Society; World Federation of Neurological Surgeons (executive Committee Member, 1969-77); Corresponding Member, Scandinavian Neurosurgical Society; Hony Member, Indo-Europe Foundation, Society of Neurological Surgeons (USA); President, INSA (1991-92).

Awards and Honours: B.C. Roy Award (1980); M.N. Sen Oration Award (1980); UGC National Lecturer (1982); FICCI Award; Jawaharlal Nehru Fellowship (1984-85); Dhanwantri Award (INSA) (1986); Outstanding Alumnus Award (K.G. Medical College, Lucknow) (1987); O.P. Bhasin Award (ICMR) (1988); Hony Surgeon to the President of India; Padma Shri (1973); Padma Bhushan (1989).

Author/Editor Facet: Co-edited 'Textbook of Neuro Surgery'; Contributed chapters to several textbooks, monographs and other standard review works like 'Progress in' series; member of editorial boards of: *Neurol. India* (editor, 1979-82), *Phronesis, Proc. Indian Nat. Sci. Acad., Quart. J. Surg.* and many other journals in medical sciences.

Policy-making Bodies: Member, Science Advisory Council to the Prime Minister, National Science & Technology Comission, National Apex Committee for Vaccine Action Programme (VAP) and Indo-US Joint Working Group on VAP, and Consultative Group of Planning Commission for Science & Technology; served as member of CSIR Society and Governing Body and as Chairman/member on several DST/DBT/ICMR committees of RAC of many institutes.

Address: Bhatnagar Fellow, All India Institue of Medical Sciences, New Delhi 110 029; Tel: (011) 6863112; Res: H-41, Scientists Apartments, CSIR Complex, Maharani Bagh, New Delhi 110 065; Tel: (011) 6834526.

TANDON, Ram Narayan

Elected 1964

Born 27 November 1903; Shikohabad, Uttar Pradesh
Ph.D. (1939), University of London, UK

Specialization: Mycology and Plant Pathology

Research Achievements: Tandon studied fungal taxonomy and fungal flora of the different regions of the country. Prepared an exhaustive list of fungi found in plains and hilly regions of Uttar Pradesh and neighbouring states. His studies on fungal diseases, especially those responsible for causing damage to crop plants and fruit trees, yielded interesting results. Conducted extensive studies on the storage diseases of a number of important fruits and assessed the role of plant pathogens causing spoilage. Also studied the fungal physiology and nutrition of different strains and species of about 45 pathogenic genera of fungi causing storage diseases of fruits and vegetables and leaf spot diseases. Established the unsuitability of various types of classifications based only on nutritional studies of fungi. Examine the post-infection changes brought about in fruits and vegetables under pathogenesis, and suggested control measures against a number of diseases.

Positions: Professor and Head, Department of Botany, University of Allahabad; Hony Principal, IAS Training Centre, Mussoorie.

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Indian Academy of Sciences, National Academy of Agricultural Sciences (India), Indian Botanical Society, Mycological Society of India, and Indian Phytopathological Society.

Awards and Honours: President, Botany Section, Indian Science Congress (1966).

Lectureships: Mundkar Memorial Lecture (Indian Phytopathological Society) (1970).

Author/Editor Facet: Member, editorial boards of: *Proc. Nat. Acad. Sci. (India)* and *J. Indian Phytopathol. Soc.*

Address: C/o Professor P.N. Tandon, Scientists Apartments, H-41 CSIR Complex, Maharani Bagh, New Delhi 110 065; Tel: (011) 6834526.

TANDON, Sohan Lal

Elected 1975

Born 11 August 1922; Nowshera, Pakistan
Ph.D. (1952), Washington State University, USA

Specialization: Botany, Cytogenetics

Research Achievements: Tandon contributed to the cytotaxonomy of a number of angiospermic taxa. Did extensive work on the role of polyploidy in evolution with special reference to solanums; the mechanism of evolution of higher chromosomal forms based on their genomic analysis; the cytoembryology of endosperm and induced polyploidy in relation to floriculture. By his dedication to research, dexterity of technique, meticulous observation and critical assessment, he greatly enriched the science of cytogenetics. He also worked on endospermic taxa at later stages of his career. His work on *Solanum nigrum* revealing the evolutionary origin of the hexaploid form has been widely recognized. He experimentally established that hexaploid solanums have arisen as a result of natural hybridization between a tetraploid and a diploid cytotype.

Positions: Professor of Botany, University of Delhi, Delhi.

Learned and Professional Societies: Founder Member, Society of Cytologists and Geneticists; Vice-President, Indian Society of Genetics and Plant Breeding (1967).

Died 27 March 1975.

TATA, J.R.D.

Elected 1985

Born 29 July 1904

The first pilot in India (1929), honorary doctorate from numerous universities, 'International Management Man', recipient of the Knight Commander's Cross of the Order of Merit of the Federal Republic of Germany (1978) and Commander of the Legion of Honour of the French Government (1983), Hony Fellow of Indian Institute of Science, Tata Institute of Fundamental Research, and Aero- Medical Society of India, Hony Member of Institution of Industrial Engineering (India) and Hony Air Vice-Marshal of Indian Air Force (1974), J.R.D. Tata had also received India's highest civilian honour, Bharat Ratna (1992). Winner of United Nations Population Award (1992) and of numerous other awards and honours from academy, industry, commerce and public life, J.R.D. was an exceptionally versatile and hard-working man who changed, for ever, the face of Indian industry (aviation in particular), commerce and business and social life to secure for the country a niche in the community of nations. Truly a 'citizen of the world', as Oliver Goldsmith would have put it. Tata helped in the promotion of Indian Science.

Industrialist, Chairman Emeritus of Tata Sons & Director of a number of Companies in the Tata Group.

Died: 28 November 1993.

TAWDE, Nanasaheb Ramji

Elected 1942

Born 15 January 1898; Salel, Maharashtra
Ph.D. (1934), University of London, UK

Specialization: Spectroscopy

Research Achievements: Tawde did theoretical and experimental studies on the spectra of some diatomic molecules, occurring particularly in astral sources and in combustion and chemical reactions. On the basis of the results he uncovered the electronic structure of many molecules.

Positions: Professor and Head, Department of Physics, Institute of Science, Bombay, and Karnataka University, Dharwar; Visiting Professor under India Wheat Loan Exchange Programme, Universities of Chicago and California (Berkeley), USA (1956-57); Acting Vice- Chancellor, Karnataka University (1962); Vice-Chancellor, Marathwada University, Aurangabad (1964-71).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Institute of Physics (London), Institution of Nuclear Engineers (England), and Maharashtra Academy of Sciences; Member, INSA Council (1953-55, 1957-59, 1962-64).

Awards and Honours: President, Physics Section, Indian Science Congress (1953).

Died 25 December 1984.

TAYLOR, Maj. Gen. Sir John

Foundation Fellow

Born 14 February 1884
M.B. (1905), M.D. (1913), LL.D. (*h.c.*) (1945), University of Glasgow, UK

Specialization: Medical Science

Research Achievements: Taylor devoted himself to the investigations of plague which in the early decades created public-health problem of first magnitude. As a member of Indian Plague Commission, set up in 1908, Taylor was largely responsible for the discovery of the mode of transmission of plague by the rat-flea. He was much concerned with the preparation of plague vaccine. He also carried out researches on snake venoms and T.A.B. Vaccine. The improved T.A.B. vaccine, produced under his leadership, from Central Research Institute saved many civil and military personnel lives during second world war.

Position: Director, Haffkine Institute, Bombay; Director, Pasteur Institute, Rangoon and also Professor of Pathology, Medical College, Rangoon; Indian Medical Service: Director, Central Research Institute, Kasauli (1932-44).

Awards and Honours: D.S.O. (1915); C.I.E. (1937); Knighted (1942); Hony Surgeon to the Viceroy (1936-41); Hony Surgeon to the King (1939-41).

Author/Editor Facet: Authored monographs on 'Haffkine Plague Vaccine', 'Preliminary Enquiry into Beri-beri in Burma' and Leptospirosis in the Andamans'; editor, *Indian J. Med. Res.*

Died 7 February 1958.

TEMPLE, Frederick Charles

Elected 1937

Born 25 June 1879

Specialization: Environmental Engineering

Research Achievements: An outstanding civil and mechanical engineer, Temple contributed greatly to the developmental work in India, particularly in Bihar State, as leader of several engineering projects of the British Indian government. Temple specialized in water purification and sewage disposal.

Positions: Civil and Consulting Engineer; Engineer, Birmingham Elan Valley Waterworks (1903-05); Military Works Services, India (1905-07); Public Works Department, India (1907-19); Chief Town Engineer (1919) and Administrator (1924-32), Jamshedpur; District Ground Secretary, District Ground Lodge of Bengal (1932-34); Relief Engineer and Supply Officer, Governments of Bihar and

Orissa (1934-35); Hony A.D.C. to Viceroy (1931-36); Lt. Col. Commanding Home Defence Bn (1940-41), Ministry of Home Security (1941-42); Regional Controller, Ministry of Fuel and Power (1942- 46); Director, Opencast Coal Production (1947-49); Councillor, Lewes Borough (1954).

Learned and Professional Societies: Member, Institution of Civil Engineers and Institution of Mechanical Engineers; President, Institution of Engineers (India) ; Fellow, Royal Sanitary Institute, and Institution of Sanitary Engineers.

Awards and Honours: Hony Colonel (1928-33); CIE (1931); CBE (1949); Viceroy's Prize (twice).

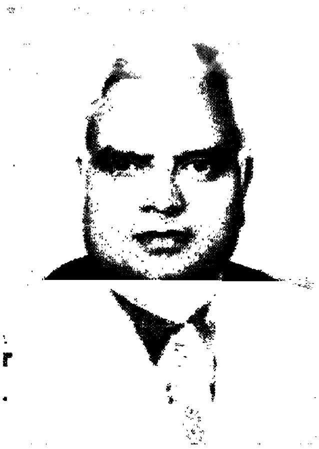
Author/Editor Facet: Wrote a book 'Sewage Works : Manual for Young Engineers in India'.

Died 26 March 1957.

TEWARI, Hrishi Bhu

Elected 1990

Born 14 May 1930; Kanpur, Uttar Pradesh
D.Phil. (1951), D.Sc (1965), University of Allahabad; Ph.D. (1961), Emory University, USA



Specialization: Cell Biology, Histochemistry and Neurochemistry

Research Achievements: Tewari has worked on the histochemistry of mammalian nervous system, covering topographical, intercellular and intracellular aspects of enzymatic distribution and their functional linkages in the various regions of brain, the highlights being the original demonstration of enzymatic cycles in neurons, cytochrome oxidase in nucleus, glucose-6-phosphatase in central nervous system and nuclear extrusions in spinal ganglion cells. His works have been quoted extensively in standard books.

Positions: UGC Emeritus Fellow (1993-); CSIR Emeritus Scientist (1991-93); Dean, College of Science; Dean, Post- Graduate Studies; Director, School of Basic Sciences and Humanities; Senior Professor and Founder Head, Department of Zoology; all at University of Udaipur (now Sukhadia University).

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Zoological Society of London, Royal Microscopical Society of England, Zoological Society, Calcutta (sometime Vice-President), and Zoological Society of India.

Author/Editor Facet: Co-author of a chapter in 'Cytology and Cell Physiology' (Academic Press); served as co-editor of *Cell Mol.Biol.*

Address: 20, Vinayak Nagar, Bohra Ganeshji Road, Udaipur 313 001; Tel: (0294) 23045.

THACKER, Maneklal Sankalchand

Elected 1953

Born 3 December 1904; Ahmedabad, Gujarat
B.Sc. (Engng) University of Bristol, UK

Specialization: Electrical Power Engineering

Research Achievements: Thacker did considerable research in power engineering: spanning design problems in electrical plant and machinery; thermal and hydropower projects, and their economics and instrumentation for power installations and related fields.

Positions: Professor, Department of Power Engineering (1947) and Director (1949), Indian Institute of Science, Bangalore; Secretary, Department of Technical Education & Scientific Research, Ministry of Education and Scientific Research; Director-General, Council of Scientific & Industrial Research.

Learned and Professional Societies: Fellow, American Institute of Electrical Engineers and Indian Academy of Sciences; President, Institution of Engineers (India), and Institute of Metals (India); Founder-President, Illumination Engineering Society and Institute of Management; Vice-President, Indian Association for the Cultivation of Science; Member, Council (1954-56), Additional Vice-President (1957), INSA.

Awards and Honours: President, Indian Science Congress (1957- 58).

Policy-making Bodies: President, Association of the Principals of Technical Institutions (India);

Other Contributions: An able science administrator, Thacker consolidated CSIR on the foundation Bhatnagar had laid.

Died 6 July 1979.

THAPAR, Gobind Singh

Elected 1952

Born 15 November 1893; Rawalpindi, Pakistan
Ph.D. (1925), University of London, UK

Specialization: Zoology, Helminthology

Research Achievements: Thapar did extensive work in helminthology. Discovered new helminths in many animals. Established a new classification of *Acanthocephala;* studied diseases of domestic animals and discovered the parasites of hump-sore and Nazar granuloma of cattle, while making a survey of parasitic infections of domestic animals in Uttar Pradesh, Bihar, Orissa, Bengal, and Assam.

Positions: Professor of Biology, Islamia College, Peshawar (1917- 18) and Canning College, Lucknow (1918-22); Professor of Zoology, University of Lucknow (1922-64).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Zoological Society of India, and Helminthological Society of India; Member, Royal Microscopic Society (London).

Awards and Honours: President, Zoology Section, Indian Science Congress (1937); Bhalerao Memorial Gold Medal (1957); Dr S.N. Singh Memorial Gold Medal (1983-84).

Author/Editor Facet: Served as editor of *Indian J. Helminthol.* and *Proc. All-India Cong. Zool.* (1965).

Died (Date N.A.)

THAPLIYAL, Jagdamba Prasad

Elected 1978

Born 5 November 1922; Tehri, Uttar Pradesh
Ph.D. (1950), Banaras Hindu University, Varanasi

Specialization: Comparative Endocrinology, Chronobiology

Research Achievements: Thapliyal established the role of thyroid in: (i) development and physiology of nonmammalian vertebrates; (ii) regulation of reproduction in reptiles, and (iii) photoperiodic responses, reproduction and migration of birds. He proposed the hypothesis, now almost universally accepted, that during evolution of homeothermy, thyroidal hormones acquired control over oxidative metabolism, and sex steroids over reproduction. Thapliyal's group was perhaps the first in the world to initiate studies on comparative endocrinology at undergraduate levels.

Positions: Professor and Head, Department of Zoology, Coordinator, School of Life Sciences, Banaras Hindu University, Varanasi; Professor and Head, Department of Zoology, North Eastern Hill University, Shillong; UGC Professor, Manipur University, Manipur; Research Associate, Rockefeller Foundation, USA.

Learned and Professional Societies: Fellow, Zoological Society of India, National Academy of Sciences (India), International Society of Chronobiology, European Society of Comparative Endocrinology, Indian Society for Reproductive Endocrinology, American Society of Zoology, Asia Oceania Society for Comparative Endocrinology, and many other professional bodies; Member, INSA Council (1987-89).

Awards and Honours: Gold Medal (Indian Society of Life Sciences) (1983); UGC National Lecturer (1979-80).

Other Contributions: It was largely due to the efforts of Thapliyal and his group the Indian Society of General and Comparative Endocrinology and the Indian Society of Life Sciences were formed.

Address: B-1/2, Seesh Mahal Colony, Kamachha, Varanasi 221 010; Tel: (0542) 65159.

THATHACHAR, Mandayam Anandampillai Lakshmi

Elected 1989

Born 20 May 1939; Mysore, Karnataka
Ph.D. (1968), Indian Institute of Science (IISc), Bangalore

Specailization: Systems Science

Research Achievements: Thathachar has made fundamental contributions to the theory and applications of learning automata. Provided a firm mathematical foundation for the design of learning algorithms by introducing the concept of absolute expediency. Developed a new class of fast-learning algorithms, called estimator algorithms. Also proposed teams and hierarchies of learning automata to form a class of stochastic neural networks which can handle problems in pattern recognition and computer vision.

Positions: Chairman, Division of Electrical Sciences (1992-) and Department of Electrical Engineering (1983-88), IISc, Bangalore; Visiting Professor, Yale University, USA (1988); University of Michigan, USA (1988); Concordia University, Canada (1989).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, Indian National Academy of Engineering and Institute of Electrical and Electronics Engineers (USA).

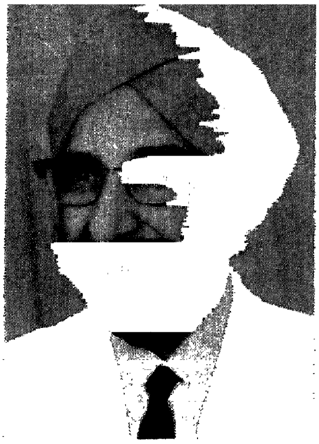
Awards and Honours: IISc Alumni Award (1992).

Author/Editor Facet: Co-authored 'Learning Automata - An Introduction' (Prentice Hall, 1989); guest editor, special issues of *J. Indian Inst. Sci.* (1987) on Neural Networks, Computer Science and Informatics (1992).

Address: Professor, Department of Electrical Engineering, Indian Institute of Science, Bangalore 560012; Tel: (080) 341 566; Fax: 080-341683; Res: No. 23, 10th Cross, Swimming Pool Extension, Malleswaram, Bangalore 560 003; Tel: (080) 367263.

THIND, Kartar Singh

Elected 1969



Born 30 October 1917; Saidpur, Punjab
Ph.D. (1948), University of Wisconsin, USA

Specialization: Mycology and Plant Pathology

Research Achievements: Thind made pioneering contributions to the exploration of mycoflora of the Himalayas, and advanced our knowledge of specific groups of fungi (Myxomycetes, Discomycetes, Pyrenomycetes, Aphyllophorales and Gasteromycetes) in India and the Himalayas. He added a large number of new taxa to the literature of fungi. Worked out the nutrient requirements of many pathogenic fungi.

Positions: Reader (1956-62), Professor (1962-80), Head (1977); Principal Investigator, DST Project on Mycoflora of the Eastern Himalaya, all at Department of Botany, Panjab University, Chandigarh.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India); President, Indian Phytopathological Society (1972), Indian Botanical Society (1973), Indian Mycological Society and Society for the Development of Asiatic Tropical Mycology; Member, Mycological Society of America, British Mycological Society and Botanical Society of America; Executive Member, International Mycological Association.

Awards and Honours: Institutional Gold Medal (Khalsa College, Amritsar) (1969); President, Botany Section, Indian Science Congress (1975); Panchanan Maheshwari Gold Medal (Indian Botanical Society) (1978); Professor T.S. Sadasivan Endowment Lecture Award (INSA) (1982); UGC National Lecturer (1982).

Author/Editor Facet: Published two monographs: 'The Clavariceae of India' (1961) and 'The Myxomycetes of India' (1977), both by ICAR.

Other Contributions: Thind built up a mycology herbarium at Panjab University.

Died 3 December 1991.

THIRUMALACHAR, Mandayam Jeersannidhi *Elected 1956*

Born 22 September 1914; Bangalore, Karnataka
D.Sc. (1944), University of Mysore; Ph.D. (1948), University of Wisconsin, USA.

Specialization: Plant Pathology, Mycology (General, Industrial and Medical)

Research Achievements: Thirumalachar has discovered some 20 new antibiotics of which hamycin and aureofungin are commercially produced by Hindustan Antibiotics, and a new jaimycin-process for making known antibiotics five to twenty times less toxic and yet more potent. These include antitumour, antifungal, antibacterial and antiviral agents. His other contributions include the development of Phyton-27, a systemic, non-toxic copper fungicide- bactericide (widely used on crop plants in the USA and Europe); MJN-1891 and Gopi-80, chemotherapeutants for citrus-greening and tristeza diseases of citrus, anti-mycoplasmal and antiviral; new microbes for biocontrol of plant parasitic nematodes and fungi; genetic transformation of pseudo-yeast to produce human insulin; JAI-PRO, a new chemotherapeutant for arthritis and muscular pain; establishment of about 30 new genera and 300 new species of fungi; and process for oil extraction from tar-sands.

Positions: Director and Founder, Jeersannidhi Anderson Institute, California, USA; Professor, Department of Pediatrics, University of Minnesota Medical School, USA; Visiting Scientist, Danish Institute of Seed Pathology, Copenhagen; Head, Research & Development, Hindustan Antibiotics, Pune; Chief Plant Pathologist, Central Potato Research Institute, Patna; Professor of Mycology & Plant Pathology, Banaras Hindu University, Varanasi.

Learned and Professional Societies: Hony Fellow, Indian Phytopathological Society (sometime President) and New York Academy of Sciences; Member, Mycological Society of America, Indian Microbiological Society, Mycological Society of India (first President); Member, INSA Council (1969-71).

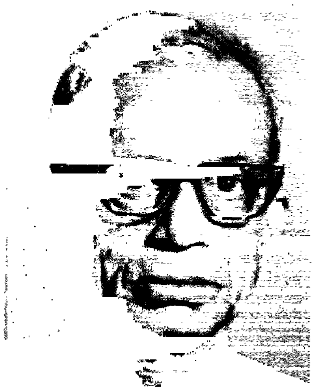
Awards and Honours: Shanti Swarup Bhatnagar Prize (1967); Sunder Lal Hora Medal (INSA) (1976); Polish Academy of Sciences Medal; President, Agriculture Section, Indian Science Congress (once).

Author/Editor Facet: Served as editor of *Hindustan Antibiot. Bull., Indian Phytopathol., Sydowia Ann. Mycol., Appl. Microbiol.* and many other journals.

Address: Director, Research & Technology, Jeersannidhi Anderson Institute, PB. 506, Walnut Creek, California 94596, USA; Tel: (510)-933-2568; Fax: (510)-933-2568.

THIRUVENKATACHAR, Venkatainchatram Rangachar

Elected 1960



Born 8 January 1908
D.Sc. (1952), University of Mysore

Specialization: Mathematical Physics

Research Achievements: Triruvenkatachar's contributions relate to elastic wave propagation induced by sources of finite extent, and by point or line source. These problems are of interest in mathematical seismology, underground explosions, etc. His work on heat transfer in composite cylinders has industrial applications.

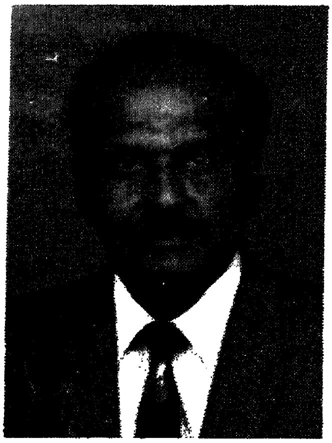
Positions: Deputy Chief Scientific Officer, Defence Research and Development Organization, Ministry of Defence, Government of India.

Addressl: C/o C. Rajagopal, 222, Sreepuram, Ist Cross, Ist Main Road, Seshadripuram, Bangalore 560 020; Tel: (080) 364263.

THOMAS, Joseph

Elected 1984

Born 20 March 1935; Palai, Kerala
Ph.D. (1962), University of Bombay



Specialization: Biological Nitrogen Fixation, Biotechnology

Research Achievements: Thomas has established that heterocysts of cyanobacteria are the site of nitrogen fixation. Pioneered the use of radioactive nitrogen (^{13}N) and demostrated the glutamine synthetase-glutamate synthase pathway in microbes and plants. His other major contributions relate to the mechanism of salt tolerance, sodium transport metabolism and organization of *nif* genes in cyanobacteria, biochemical characterization of glutamine synthetases as well as legume-*Rhizobium* interactions.

Positions: Hony Director, Centre for Biotechnology, SPIC Science Foundation, Madras; Executive Director, Biotechnology and Seeds, SPIC, Madras; Head, Biological Nitrogen Fixation Laboratory, Bhabha Atomic Research Centre, Bombay.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Agricultural Sciences (India), Member, Guha Research Conference.

Awards and Honours: FICCI Award (1991-92).

Author/Editor Facet: Served on editorial boards of *Indian J. Exp. Biol.*

Policy-making Bodies: Member, Governing Body of Council of Scientific and Industrial Research and its Society, Research Council of Centre for Cellular and Molecular Biology, Hyderabad, National Botanical Research Institute, Lucknow and of International Advisory Committee on Biological Nitrogen Fixation.

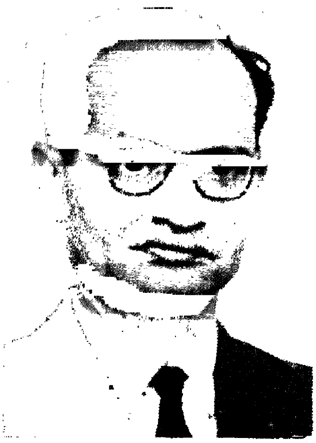
Other Contributions: Established the centre for biotechnology at SPIC Science Foundation, Madras.

Address: Hony Director, SPIC Science Foundation, 110, Mount Road, Guindy, Madras 600 032; Tel (044) 2352039, 2351504; Telex: 041- 8908/8921; Fax: 91-44-2352163; E-mail: JT%ssftwo@iitm.ernet.in; Tel: (044) 2341024 (Res).

THOSAR, Baji Vinayak

Elected 1977

Born 3 April 1913; Khamgaon, Maharashtra
Ph.D. (1949), Birmingham University, UK



Specialization: Nuclear Physics, Solid State Physics

Research Achievements: Thosar has studied the luminescence of ruby crystal and positron annihilation in molecular materials using a free volume model.

Positions: Emeritus Professor and Dean, Physics Faculty, Tata Institute of Fundamental Research, Bombay; Visiting Scientist, Niels Bohr Institute, Copenhagen (1963, 1968); National Science Foundation (USA) Visiting Scientist (1969).

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: Raman Centenary Gold Medal (1988),

Author/Editor Facet: Published a book 'Growing up with Science in India' (1992).

Other Contributions: Set up an active nuclear spectroscopy group at TIFR, Bombay; Chairman, National Advisory Committee for International Conference on Positron Annihilation, Delhi (1985).

Address: Terrace View Society, Flat 13, Jeevan Bima Nagar, Borivili West, Bombay 400 103; Tel: (022) 8935277.

TILAK, Bal Dattatraya

Elected 1962

Born 26 September 1918; Karanja, Maharashtra
D.Sc. (1960), University of Oxford, UK

Specialization: Chemistry, Technology and Dyestuff Technology

Research Achievements: Tilak's significant research achievements are in organic chemistry and organic chemical technology with special reference to chemistry of heterocyclic compounds, heterocyclic steroids, chemotherapeuticals and synthetic dyes. He has also contributed to the country's march towards self- reliance in technology. The industrial research carried out under his leadership has led to the establishment of several small-, medium- and large- scale industries which are producing organic intermediates, dyes, pesticides and textile auxilaries.

Positions: Consultant, Centre for Application of S & T for Rural Development, Indian Institute of Education, Pune; Director (and now Consultant), National Chemical Laboratory, Pune (1966-78).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Maharashtra Academy of Sciences; Member, INSA Council (1972-74).

Awards and Honours: K.G Naik Gold Medal (M.S. University of Baroda) (1959); Basudeo Banerjee Gold Medal (Indian Chemical Society) (1960); Shanti Swarup Bhatnagar Prize (1963); Padma Bhushan (1972).

Lectureships: Professor K. Venkataraman Lecture (1968) and K. H. Kabbur Memorial Lecture (1973) (both of University of Bombay); Amin Memorial Lecture (Indian Chemical Manufacturers Association) (1976); and P.C. Ray Memorial Medal and Lecture (Indian Chemical Society) (1979).

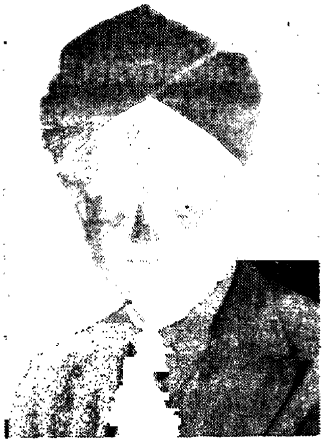
Policy-making Bodies: Chairman, Board of Directors, Hindustan Organic Chemicals Ltd. (1967-76); served on the Boards of Directors, Indian Investment Centre, Indian Petrochemicals Corporation Ltd., Indian Drugs and Pharmaceuticals Ltd., Hindustan Antibiotics Ltd., National Industrial Development Corporation of Maharashtra Ltd. and other bodies.

INSA has instituted 'Professor Bal Dattatraya Tilak Lecture Award' to honour him.

Address: Centre for Application of S & T for Rural Development, Indian Institute of Education, Pune; Tel: (0212) 331214; Res: 101, Anand Park, Pune 411 007; Tel: (0212) 336153.

TIRUMURTI, Tirunelveli Subbaiyer

Foundation Fellow



Born 18 November 1885; Pollachi, Tamil Nadu
M.B. & C.M., D.T.M. & H

Specialization: Medical Science, Pathology

Research Achievements: Tirumurti's contributions pertain to portal hypertension and cirrhosis of the liver and other related disorders in adults. He established that malaria *per se* had no relationship to cirrhosis; above all when indeed chronic malaria rampant stands the pioneering studies on the pathology of infantile biliary cirrhosis now known as Indian Childhood Cirrhosis. He made an in-depth study of public health practices and policies; accorded priorities to public health, as opposed to curative medicine. His vision of medical research in India was based on his in-depth studies of historical contributions of Indian medical thought through the ages.

Positions: Madras Medical Service (1905), Professor of Pathology, Madras Medical College; Principal, Medical College, Vishakhapatnam; Chief Medical Officer, Harbour, Vishakhapatnam; Principal, Stanley Medical College, Madras; Officiating Vice- Chancellor, Andhra University.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Member, All India Medical Association (President, 1952) and; Madras Medical Council (Vice-President).

Awards and Honours: President, Medical and Veterinary Section, Indian Science Congress (1939); *Rao Sahib*; *Rao Bahadur.*

Author/Editor Facet: Member, editorial board, *J. Paediat. J. Venereol. and J. Indian Med. Assoc.*

Policy-making Bodies: Member, Provincial Drug Control Advisory Committee, Travancore Legislature, Standing Committee on Population Hygiene and Indian Institute of population Research; Hony Chairman, Medical and Public Health Reorganization Committee, Travancore State.

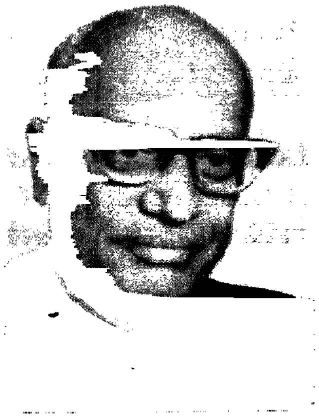
INSA has instituted 'Dr T.S. Tirumurti Memorial Lecture'.

Died 26 August 1953.

TOSHNIWAL, Govind Ram

Elected 1943

Born 21 January 1904; Ajmer, Rajasthan
D.Sc. (1936), University of Allahabad



Specialization: Radio Physics, Instrumentation

Research Achievements: Toshniwal made substantial contributions to ionospheric physics triplet splitting discovery of the radiowave. He pioneered instrumentation for research and industry. He was known internationally for his contributions to radio-physics in his capacity as Chairman, Toshniwal Industries Pvt. Ltd.

Positions: Chairman, Managing Director, Toshniwal Brothers Private Limited (1948-72) and Toshniwal Industries Private Limited.

Learned and Professional Societies: Senior Life Member, Institute of Electrical and Electronics Engineers (USA); President, Institution of Electronics and Telecommunication Engineers (India) (1972), and Magnetics Society of India.

Awards and Honours: President, Engineering and Metallurgy Section, Indian Science Congress (1972).

Policy-making Bodies: Served on various committees of Bureau of Indian Standards, and as Member, Development Council for Instruments, Government of India.

Died 29 September 1990.

TREHAN, Surindar Kumar *Elected 1976*

Born 4 April 1931; Gujrat, Pakistan
Ph.D. (1958), University of Chicago, USA

Specialization: Magnetohydrodynamics, Plasma Physics

Research Achievements: Trehan has made significant contributions to our understanding of the stability of force- free magnetic fields, of jets and cylinders, and of inhomogeneous plasmas. His work on the mathematical treatment of gaseous polytropes in the presence of a magnetic field may prove to be a breakthrough. Also made contributions to the study of hydromagnetic waves and rotating gaseous masses. Now engaged in the nonlinear studies in magnetohydrodynamics. He has given, for the first time, a consistent account of the modulational stability of bounded systems taking into account the boundary conditions consistently.

Positions: CSIR Professor Emeritus, Department of Mathematics and Dean, Science Faculty, both at Panjab University, Chandigarh (1980-82, 1989).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India); Vice- President, Astronomical Society of India (1976-78); Member, INSA Council (1977-79).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1976); B.C. Roy Award ('Eminent Person in Sciences') (1989); UGC National Lecturer (1977-78); UGC National Fellow (1983); President, Mathematics Section, Indian Science Congress (1984)

Author/Editor Facet: editor, *Bull. Astron. Soc. India* (1980- 91); member, editorial boards of: *J. Math. Phy. Sci.*, *J. Astrophys. Astron.*, and other journals; Editor of Publications, INSA (1979-82).

Policy-making Bodies: Chairman, National Committee for the International Astronomical Union (1978-81); Served on many expert committees of CSIR, UGC, etc. and governing councils of Indian Statistical Institute and Indian Association for the Cultivation of Science.

Address: 146, Sector 9B, Chandigarh 160 009; Tel:(0172) 29938.

TREVOR, Sir Charles Gerald

Foundation Fellow

Born 28 December 1882; Waleshpool, UK
Royal Imperial Engineering College, Coopers Hill, UK

Specialization: Forestry

Research Achievements: Trevor made significant contributions to the development of Indian forestry, particularly to its technical aspects. He standardized the techniques of forest nursery work in the hills. His work on natural regeneration of deodar, spruce and silver fir was highly appreciated. He also standardized the silviculture and management techniques, thinning, artificial and natural regeneration, nursery techniques, fire protection, felling, forest maps and many other aspects of forestry.

Positions: Indian Forestry Service: Assistant Conservator of Forests, Punjab (1903-20); Conservator of Forests, United Provinces (1920-26); Vice-President and Professor of Forestry, Forest Research Institute, Dehra Dun (1926-30); Chief Conservator of Forests, Punjab and North-West Frontier Province (1930-33); Inspector-General of Forests, Government of India (1933-37).

Learned and Professioal Societies: Fellow, Royal Welsh Agricultural Society.

Awards and Honours: CIE (1933); Knighted (1937); High Sheriff (J.P.), Montgomery County.

Author/Editor Facet: Trevor co-authored 'Manual of Indian Silviculture', and 'Practical Forest Management' (1923).

Died 20 May 1959.

TRIBEDI, Bishnu Pada

Elected 1943

Born 1898
DB, University of London, UK

Specialization: Pathology

Research Achievements: Tribedi made notable contributions to pathology and bacteriology.

Positions: Professor of Pathology, Medical College, Calcutta; Bacteriologist, Government of West Bengal.

Learned and Professional Societies: President, British Medical Association, Indian Medical Association, and Indian Association of Pathologists and Microbiologists; Member, Asiatic Society.

Author/Editor Facet: Served on editorial boards of: *J. Indian Med. Assoc.* and *J. Calcutta Med. Club.*

Died 29 October 1985.

TRIVEDI, Bhim Shanker

Elected 1981

Born 3 May 1923; Shukla Khera, Unnao, Uttar Pradesh
Ph.D. (1954), University of Lucknow

Specialization: Palaeobotany, Morphology, Pteridology, Spermoderm Structure

Research Achievements: Trivedi has established Tertiary age for the Saline Series, and Salt Range Punjab (now in Pakistan) on the basis of fossil evidence. Made extensive palaeobotanical investigations of the Tertiary flora of India. Contributed to the knowledge of the effects of strong magnets on fern gametophytes. Has made extensive and intensive studies on the ontogeny of angiosperm stomata and notable contributions to the knowledge of spermoderm structure of angiosperms.

Positions: Professor and Head, Department of Botany, University of Lucknow, Lucknow (Retd).

Learned and Professional Societies: President, Indian Botanical Society and Palaeobotanical Society.

Awards and Honours: Silver Jubilee Medal (Palaeobotanical Society); Birbal Sahni Centenary Gold Medal.

Author/Editor Facet: Co-authored three books; one on angiosperm taxonomy and two on morophology of gymnosperms and pteridophytes.

Policy-making Bodies: Representive on the International Organization of Palaeobotany for the South East Asia.

Address: B-8, Sector A, Mahanagar, Lucknow 226 006; Tel: (0522) 71481.

TRIVEDI, Hrishikesh

Elected 1961

Born 16 June 1909
D.Sc. (1936), University of Allahabad

Specialization: Metallurgy

Research Achievements: Trivedi did extensive research and development work in metallurgy. He produced cast iron with extraordinary properties. Designed, fabricated and commercially produced a variety of machines and equipment for iron, steel and nonferrous industries; as well as transportation and chemical industries for the first time in India, e.g. rolls and rolling mills for the steel and non- ferrous industries; chilled iron wheels for the railways; road rollers; sophisticated internal combustion engines; plants for producing high explosives and cement and machinery for mining industry. He took up the study of the basic problems of the Indian steel industry: abject dependence on the acutely deficient resources of coking coal. His aim was to work out a new technology which does not depend on coking coal. He succeeded by substitution of coal with hydrogen.

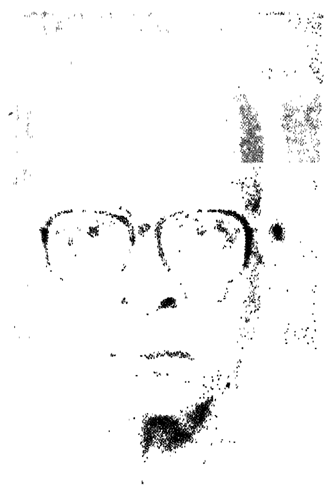
Positions: Director, Harcourt Butler Technological Institute, Kanpur; Chief Metallurgist and Works Superintendent, Jamshedpur Engineering and Machine Manufacturing Co. Ltd., Tatanagar; Industrial Adviser to Government of Uttar Pradesh; Technical Consultant, Programme of Technical Assistance, United Nations.

Learned and Professional Societies: Member, INSA Council (1973- 75).

Died 29 November 1990.

UDGAONKAR, Bhalchandra Madhav

Elected 1984



Born 14 September 1927; Karad, Maharashtra
M.Sc. (1949), University of Bombay

Specialization: Theoretical Physics

Research Achievements: A phenomenological framework for high energy cross-sections, in terms of Regge poles in the crossed channel, proposed by Udgaonkar in 1962, motivated a large number of very accurate measurements of high-energy cross-sections, and much basic and phenomenological work in the 1960s and 1970s. Udgaonkar (with Virendra Singh) also made some important contributions to the bootstrap approach to hadron dynamics during this period.

Positions: Senior Professor, Tata Institute of Fundamental Research, Bombay; Member, Institute for Advanced Study, Princeton, USA (1962-63,1966,1971).

Learned and Professional Societies: Fellow, Indian Academy of Sciences; President, Indian Physics Association (1971-73), Maharashtra Academy of Sciences (1979-82), and Indian Academy of Social Sciences(1988-89); President, *Marathi Vidnyan Parishad* (1982-85, 1985-91).

Awards and Honours: Senior Award (Homi Bhabha Fellowships Council) (1981); Hari Om Trust Award (UGC) (1989); Padma Bhushan (1985).

Lectureships: Sir Alladi Krishnaswami Endowment Lecture (Andhra University, Waltair) (1979); S.N.Bose Memorial Lecture (1990); IIT-Bombay Foundation Day Lecture (1991).

Author/Editor Facet: Editor, *Phys. News* (1975-87), joint editor *Pramana* (1975-81); edited/co-edited 5 books, among them 'Science and Technology Policy in Eighties and Beyond' (Longmans, 1984), 'Homi Jehangir Bhabha: Collected Scientific Papers' (TIFR, 1985), and 'A Nuclear Weapon-Free World: Desirable ? Feasible ?' (Westview Press, 1993).

Policy-making Bodies: Member, IUPAP Commission on Particles and Fields (1969-72; 1972-75), Unesco Working Group on Research and Human Needs (1975-76), Pugwash Steering Committee for providing Guidelines for International Scientific Cooperation for Development (1978-79), Intergovernmental Group of

Experts on UN Financing System for Science and Technology for Development (1979-81).

Other Contributions: Udgaonkar has endeavoured to foster scientific temper and popularize science; he was the Chairman, National Organizing Committee, *Bharat Jan Vigyan Jatha* (1987).

Address: 705 Vigyan, Plot No. 23, Sector 17, Vashi, New Bombay 400 703; Tel: (022) 5515036 (Off), (022) 7684515 (Res).

UDUPA, Handady Venkata Krishna

Elected 1971

Born 18 October 1921; Handady
Ph.D. (1950), Ohio State University, USA

Specialization: Chemistry, Electrochemical Science & Technology

Research Achievements: Udupa has contributed substantially to several aspects of electrochemistry and electrochemical technology. These include: (i) use of a rotating electrode technique in electroorganic reductions and oxidations, which simplifies the design of high-capacity cells using high- current densities, (ii) production of organic compounds using electrolytically regenerated inorganic reagents, (iii) direct electrochemical reduction of metal oxides and hydroxides to the corresponding metal power and (iv) development of insoluble anodes, such as graphite substrate lead dioxide anode and titanium substrate insoluble anode, for production of inorganic chemicals. He has nearly 140 patents to his credit.

Positions: Emeritus Professor, Chemical Engineering Department, Manipal Institute of Technology; CSIR Emeritus Scientist, Director, Central Electrochemical Research Institute, Karaikudi; Visiting Professor, Tokyo Institute of Technology.

Learned and Professional Societies: Fellow, Institution of Chemists, Indian Standard Institution (now Bureau of Indian Standards), Tamil Nadu Academy of Sciences, and Society for the Advancement of the Electrochemical Science and Technology; Hony Fellow, Electrochemical Society of India; Member, Royal Society of Chemists and Electrochemical Society (USA); Member, INSA Council (1976-78).

Awards and Honours: Seven Awards of Invention Promotion Board; H.K. Sen Memorial Medal Award (Institution of Chemists, India) (1979); FICCI Award (1973, 1974).

Author/Editor Facet: Contributed chapters to: 'Technique of Electroorganic Synthesis', 'Encyclopedia of Electrochemistry of the Elements' and 'Manual of Chemical Technology'; Chairman, publication committee, *J.Soc. Adv. Electochem. Sci. Technol.*

Address: 9-4-138, V.T. Road, Tenkapete, Udupi 576 101; Tel: 21487.

UKIL, Amulya Chandra

Elected 1935

Born 14 November 1888; Bongaon, Bangladesh
M.B.B.S., M.S.P.E., University of Paris, France, F.S.M.F. (Hons), F.C.C.P..,F.A.S., University of Calcutta

Specialization: Medical Science (Tuberculosis)

Research Achievements: Ukil, who initially worked on pernicious malaria, will be remembered, however, for his pioneering work on tuberculosis. He studied all aspects of the infection, namely bacteriology, epidemiology, diagnosis, treatment, control and prevention, and made original observations and added substantially to our knowledge. A pathogenic anaerobic bacillus bears his name, *Bacillus Ukilli.*

Positions: Professor of Botany and Resident Medical Officer, Daulatpur Hindu Academy, Khulna, now in Bangladesh (1914-15); Professor of Bacteriology, National Medical Institute, Calcutta (1921-23); Physician-in-charge, Chest Department and Principal, Calcutta Medical College and associated hospitals (resigned 1948); Consulting Physician, Chest Department, Calcutta Medical College and Hospital (till 1963).

Learned and Professional Societies: Fellow, Royal Society of Tropical Medicine and Hygiene (London) and Royal Sanitary Institute (London); Corresponding Member, French Pathological Society, Society of Tropical Pathology (Paris), and American College of Chest Physicians; Chairman, Bengal Tuberculosis Association (1948); President, All India Tuberculosis Workers' Conference; President, Indian Medical Association (1955-56) and Asiatic Society (1956); President, INSA (1955- 56).

Awards and Honours: Coates Gold Medal (1935); *Kaiser-i- Hind* Gold Medal (1942); Barclay Medal (Asiatic Society) (1951); Gold Medal (Tuberculosis Association of India).

Lectureships: Basantha and J.C. Bose Memorial Lectures (University of Calcutta).

Author/Editor Facet: Edited *Sci. & Cult.*

Policy-making Bodies: Seriff of Calcutta (1955-56); Member, Central Committee on Tuberculosis (Germany); Scientists Panel, Indian National Planning Commission.

Other Contributions: Ukil gave impetus to popularisation of science and support to the compilation of an Indian History of Science and Medicine. Was responsible for founding the Indian Institute of Experimental Biology at Calcutta.

The Bengal Tuberculosis Association named an award after him.

Died 24 February 1970.

UPPAL, Badri Nath

Elected 1944

Born 28 June 1900; Eminabad, Pakistan
Ph.D. (1925), Iowa State University, USA; D.Sc. (*h.c.*), Punjab Agricultural University, Ludhiana

Specialization: Botany, Agriculture

Research Achievements: Uppal did some work on crop diseases and described some new species of fungi and bacteria. His contributions lay, however, in building up infrastructure for agricultural research. He established a plant virus centre at Pune, a cotton wilt centre also at Pune, a wheat research centre at Mahabaleshwar, and regional centres for intensive research on cotton, oilseeds, millets. Besides, he set up a fertilizer plant, a wasteland survey and reclamation outfit and vocational schools for farmers.

Positions: Instructor, Department of Botany, Iowa State University; Fellow, Iowa Experiment Station; Plant Pathologist to the Bombay Government; Professor of Plant Pathology and Principal, College of Agriculture, Pune; Director of Agriculture (also of R&D), Bombay; Agricultural Commissioner to the Government of India; Hony Agricultural Adviser, Punjab Government.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Indian Phytopathological Society; Member, Gamma, Sigma, Delta, Kappa Phi, and Sigma Xi.

Awards and Honours: MBE (1945); Iowa State University Centennial Year Award (1958); Padma Shri (1959).

Died 22 November 1989.

UPPAL, Harbans Lal *Elected 1952*

Born 5 March; 1905
D.Sc., Panjab University, Chandigarh; Ph.D., Panjab University, Lahore

Specialization: Soils Science, Flood Control, Irrigation Research

Research Achievements: Uppal was responsible for: (i) finalizing the design of Bhakra Dam, Beas Dam, and Pandoh Dam with the help of model studies; (ii) design of a number of sediment extruders and silt ejectors; (iii) soil conservation and water management, management of water- logging and control of salinity, lining of canals; and (iv) planning, design and operation of models for rivers, dams, spillways, hydraulic, and hydroelectric structures. He has traced practically all the rivers of Punjab- Beas, Ravi, Satluj, Ghaggar, Chenab and Jhelum- and Tawi, Ujh, Basantee and Devak rivers in Jammu & Kashmir.

Positions: Professor Emeritus, Punjab Agricultural University, Ludhiana (1970-); Director, Irrigation and Power Research Institute, Amritsar (1951-66); Adviser, Flood Control, Punjab and Jammu & Kashmir governments for over a decade; Adviser, Damodar Valley Corporation and Assam Government.

Learned and Professional Societies: Fellow, Institution of Engineers (India).

Awards and Honours: Kennedy Gold Medal (1945); Punjab Engineering College Medal (1945); Union Ministry of Irrigation and Power Gold Medal and Cash Award (1966, 1967); Sir Arthur Cotton Memorial Award (1967); Central Board of Irrigation and Power Gold Medal (1967); Union Ministry of Irrigation and Power Cash Award (1973).

Author/Editor Facet: Written 'Flood Control Studies in Jammu & Kashmir State'.

Other Contributions: One major work Uppal did during 1947-50 at the Hydraulic Research Station, Madhopur (Punjab) was using "soils technology" for Forward Defence Lines, a piece of work greatly appreciated by the Army.

Address: 8/37, Punjab Agricultural University, Ludhiana 141 004; Tel:(0161) 51960/201 (Off), (0161) 51960/364 (Res).

VACHELL, Eustacl Tanfield

Elected 1942

Born 8 January 1893; Cardiff, UK
M.A. (1916), University of Cambridge, UK

Specialization: Geology

Research Achievements: Vachell made extensive geological investigations in India, Burma and Pakistan.

Positions: Senior Geologist, Burmah Oil Company (1919-43); Senior Geologist, Geological Survey of India.

Learned and Professional Societies: Fellow, Geological Society of London and Society of Antiquaries (London); Member, Council of Mining and Metallurgical Institute of India and Institute of Petroleum.

Died 5 March 1981.

VAIDYA, Prahlad Chunilal

Elected 1988

Born 23 March 1918; Shahpur, Gujarat
Ph.D. (1949), University of Bombay

Specialization: General Relativity and Gravitation

Research Achievements: The gravitational field of a radiating star obtained by Vaidya in 1943, 1951 and 1953 has found numerous applications in discussions of highly condensed objects in astrophysics. This solution of Einstein's equations is now known in literature as Vaidya metric.

Positions: Chancellor, Gandhi Vidyapeeth, Ahmedabad; Vice- Chancellor, Gujarat University, Ahmedabad; Chairman, Gujarat Public Service Commission; Professor of Mathematics, Gujarat University, Ahmedabad.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Founder Member, International Society of General Relativity and Gravitation.

Address: 34, Shardanagar, Ahmedabad 380 007; Tel: (0272) 436959.

VAIDYA, W.M.

Elected 1953

Born 12 November 1904
Ph.D., University of London, UK

Specialization: Optics, Spectroscopy

Research Achievements: Vaidya did some pioneer work on flame spectra and elucidated the mechanism of combustion processes. He discovered a new band system in the spectra of hydrocarbon flame, named 'Vaidya bands'. He specialised in problems of vision at low levels of illumination with applications to safety of aircraft and railways. By organizing projects on cockpit illumination and lighting on runways, he helped to build up the efficiency of the Indian Air Force planes. He assisted the Indian industry to improve the quality of railway signal glasses so as to bring them up to international safety requirements. As a result, India become self-sufficient in signal glasses and also built up a flourishing export market.

Positions: Assistant Director, Optics Division, National Physical Laboratory, New Delhi; Professor of Physics, Karnatak University, Dharwar.

Awards and Honours: President, Physics Section, Indian Science Congress (1966).

Died (Date N.A.)

VAIDYANATH, Lakshminarayanapuram Ramier

Elected 1977

Born 17 February 1924; Jamshedpur, Bihar
Ph.D. (1959), University of Birmingham, UK

Specialization: Industrial Metallurgy

Research Achievements: Vaidyanath has carried out research on rolling, forging, wire-drawing and fatigue of metals. He has developed (i) controlled friction materials for Railways; (ii) fluxless process of smelting for producing ferro- manganese; and (iii) a new process of autogenous bonding of similar and dissimilar metals without the application of external heat.

Positions: Director, Indian Copper Development Centre (ICDC), Calcutta; Production Manager and Officer on Special Duty, Khandelwal Ferro Alloys Ltd; Works Manager, Gujarat Steel Tubes Ltd.

Learned and Professional Societies: Fellow, ASM International (USA) and Institute of Materials (UK); Hony Member, Indian Institute of Metals (IIM).

Awards and Honours: Sir William Larke Medal (1962); Distinguished Alumnus Award (Banaras Hindu University) (1973); BRALCO Gold Medal (1980); Tata Gold Medal (IIM) (1986).

Author/Editor Facet: Edited many of ICDC's publications.

Policy-making Bodies: Member, Programme Review Committee, International Copper Association Ltd (USA), and Working Group on Non-Ferrous Metals, Ministry of Mines.

Other Contributions: As a Senior Council Member of IIM, Vaidyanath has helped the Institute conduct programmes for the development of metallurgical industry.

Address: Director, Indian Copper Development Centre, 27B, Camac Street, Calcutta 700 016; Tel: (033) 2475724/25; Telex: 7786; Fax: 2472763; Res: 8 Sarat Chatterjee Avenue, Calcutta 700 029; Tel: (033) 761447.

VAIDYANATHAN, Chelakara Sivarama

Elected 1982

Born 14 November 1931; Palghat, Kerala
Ph.D. (1954), University of Madras

Specialization: Biochemistry, Enzymology

Research Achievements: Vaidyanathan has contributed to the understanding of the metabolism of aromatic compounds, elucidated several new pathways and discovered new enzymes with novel types of mechanism of action. He demonstrated the fission of aromatics by plant enzymes. Obtained evidence for the involvement of superoxide anions in certain enzyme- catalysed reactions.

Positions: CSIR Emeritus Scientist, Professor, Department of Biochemistry and Dean, Faculty of Science (1974-75), all at Indian Institute of Science (IISc), Bangalore.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Life Member, Society of Biological Chemists (India), and Association of Microbiologists; Member, Guha Research Conference.

Awards and Honours: Golden Jubilee Award (University of Mysore) (1969); P.S. Sarma Memorial Award (Society of Biological Chemists, India) (1975); J.C. Bose Award (1976); Hari Om Ashram Trust Award (1976).

Author/Editor Facet: Member, Editorial Board, *Indian J. Biochem. Biophys.* (1976-77); Associate Editor, *J. Indian Instt.* Sc. (1978-82).

Policy-making Bodies: Member, Senate Committee for Research and Academic Policy, IISc (1974-75), UGC Review/Advisory Committee for many Universities.

Address: CSIR Emeritus Scientist, Department of Biochemistry, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2473); Res: 001, Ground Floor, ATMA Apartments, K.T., 10th Main Road, Malleswaram, Bangalore 560 003; Tel: (080) 340187.

VAKIL, Rustom Jal

Elected 1959

Born 17 July 1911
M.R.C.P., University of London, UK; M.D. (1937), University of London, UK

Specialization: Medicine

Research Achievements: Vakil focused the attention of western medical scientists on *Rauvolfia serpentina.* As a result he won the sobriquets 'father of Indian cardiology' and 'father of Rauvolfia'. He was the first to carry out large-scale statistical studies on the incidence of various types of heart disease, especially coronary heart disease. He published a survey of 20 years' study of several thousand cases of ischaemic heart disease, including 25,000 cases of coronary thrombosis observed personally. First to use the term 'pre-infarction syndrome', Vakil also made some other entirely new clinical titles in medical science, namely 'hexalogy of the heart', 'giant cell arteritis in aortic regurgitation', 'transitory pulsation in coronary thrombosis', 'gummatous forms of rat-bite fever', and 'subacute pulmonary oedema'. He suggested several new classifications of abnormal heart rhythms, anterior thoracic pain, and congenital heart disease. Vakil was interested in another Indian plant *Nardestachya jatamanshi* and wrote about its utility in the treatment of neuropsychiatric disorders.

Positions: Assistant Hony Physician, J.J. Hospital and Grant Medical College, K.E.M. Hospital and Seth G.S. Medical College, Bombay.

Learned and Professional Societies: Fellow, Royal College of Physicians (London), American College of Cardiology, and American College of Physicians; Governor, Western Indian Chapter, American College of Chest Physicians; Coordinator, All India Heart Foundation; President, Cardiological Society in India.

Awards and Honours: Lasker Award of American Public Health Association (first Asian to receive it) (1949); First Dr.B.C. Roy Award (Indian Medical Council) (1969); Shanti Swarup Bhatnagar Prize and the first Dhanwantari Award (1973); one of the four Indian clinicians to figure in American Register of International Notables. The Institute of Cardiology and Research Centre at the K.E.M. Hospital, Bombay, is named after him.

Author/Editor Facet: Vakil authored many books; to name a few: 'Clinical Diagnosis', 'Textbook of Medicine', 'Diagnosis and Management of Medical Emergencies' and 'The Romance of Healing, and other Essays'.

Policy-making Bodies: Trustee, Wadia Institute of Cardiology, Pune.

Died 20 November 1974.

VALDIYA, Khadg Singh

Elected 1980

Born 20 March 1937; Kalaw, Burma
Ph.D. (1963), University of Lucknow

Specialization: Tectonics, Environmental Geology, Sedimentary Geology

Research Achievements: Valdiya has studied the impact of collision of Indian and Asian Plates on the Indian subcontinent as manifested in buckling and splitting of the Himalayan domain and resultant thrusting, uplift and displacement of dismembered blocks following renewal, including, in recent times, of movements on active faults - locally very spectacular and fast. His work on algal-built stromatolites led to fixing precise ages of stratigraphically tangled lesser Himalayan formations. He has carried out palaeocurrent studies to reconstruct palaeoslope and palaeogeography of the Himalayan and adjacent domains. Has made a significant contribution to landslide hazard-zonation and pioneering studies on hydrogeology of mountain springs.

Positions: Professor of Geology and Head, Department of Geology, Kumaun University (1976-); Acting Vice-Chancellor, Kumaun University, Nainital (1981, 1985, 1992); Additional Director, Wadia Institute of Himalayan Geology (1980).

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), and Geological Society of India; Member, INSA Council (1984-86).

Awards and Honours: Shanti Swarup Bhatnagar Prize (1976); UGC National Lecturer (1977-78); L. Rama Rao Gold Medal (Geological Society of India) (1979); Pitamber Pant National Environment Fellowship (Department of Environment) (1982-84); SERC Lecturer of Department of Science & Technology (1991-92); S.K. Mitra Memorial Lecture Award (INSA) (1992).

Author/Editor Facet: Authored three books and two monographs; member, editorial board, *Curr. Sci.* (1986-); co-editor, *Himalayan Geol.* (1971-73); edited six books.

Policy-making Bodies: Vice-Chairman, Coordinating Committee National Committee, International Lithosphere Programme (1976- 82).

Other Contributions: Valdiya is deeply involved in the environmental movement and engaged in ecodevelopment work in Kumaun Himalaya; also interested in popularization of earth sciences in Hindi.

Address: Professor, Department of Geology, Kumaun University, Nainital 263 002; Tel: (05942) 2114; Res: 9, Sleepy Hollow, Nainital 263 001; Tel: (05942) 2283.

VALIATHAN, Marthanda Varma Sankaran

Elected 1984

Born 24 May 1934; Mavelikara, Kerala
F.R.C.S (1960), England; Ch.M. (1962), University of Liverpool, UK; F.R.C.S (Cardiovascular) (1970), Royal College of Surgeons and Physicians of Canada

Specialization: Cardiac Surgery

Research Achievements: Valiathan's contributions lie in the characterization and application of graphite benzalkonium- heparin coating of materials in cardiac surgery; development of a geochemical hypothesis in the causation of endomyocardial fibrosis and its experimental demonstration; and development of indigenous technologies for heart valve, oxygenator and cardiotomy reservoir.

Positions: Director, Sree Chitra Tirunal Institute of Medical Sciences and Technology, Trivandrum; Visiting Professor of Biomedical Engineering, Indian Institute of Technology, Madras.

Learned and Professional Societies: Fellow, Indian Academy of Sciences (sometime Vice-President), National Academy of Medical Sciences (India), National Academy of Sciences (India), Indian National Academy of Engineering, American College of Cardiology, Indian Association of Cardiothoracic Surgeons, Society of Thoracic Surgeons, (USA), and Society of Cardiothoracic Surgeons of UK and Ireland; Member, INSA Council (1991-93).

Awards and Honours: Hunterian Professor, Royal College of Surgeons, England (1969); Kerala State Award in Science and Technology (1982); R.D. Birla Award (1986); O.P. Bhasin Award (1987); Shri Dhanwantari Prize (INSA) (1991); Padma Bhushan (1990).

Lectureships: CSIR Distinguished Lectures; Sir A.L. Mudaliar Lecture; Sir C.V. Raman Lectures; P.K. Sen Lecture; C.S. Sadasivam Oration; Col. Sangham Lal Oration.

Author/Editor Facet: Served on editorial boards of: *Curr. Sci., Bull. Mater. Sci.,, Nat. Med. J. India* and *J. Mater. Med.*

Policy-making Bodies: Council Member, Association of Commonwealth Universities (London); President, Association of Indian Universities.

Other Contributions: Institutionalizing the convergence of medical sciences and technology in India with emphasis on the transfer of technology to industry.

Address: Director, Sree Chitra Tirunal Institute for Medical Sciences and Technology, Trivandrum 695 011; Tel: (0471) 443085; Fax: 91-471-446433; Telex: 0435-290; Telegram: CHITRAMET; Res: No.6, Katakompally Scheme, Pulaynarakotta, Trivandrum 695 011; Tel: (0471) 448546.

VARADACHARI, Veeravalli Venkata Ranga *Elected 1981*

Born 1 July 1925; Gutala, Andhra Pradesh
D.Sc. (1959), Andhra University; D.Sc. (*h.c.*), Rani Durgavati University, Jabalpur

Specialization: Physical Oceanography and Meteorology

Research Achievements: Varadachari has contributed to physical oceanography, by delineating the physical and dynamic aspects of upwelling, wave refraction and ocean currents along the Indian coastline. He has made significant contributions to coastal oceanography and coastal zone management, particularly on problems of beach erosion, mud banks along Kerala coast, littoral and rip currents, harbour sedimentation, and the like. His basic researches have triggered applied researches and led to the sponsoring of projects in coastal oceanography. He has also made significant contributions on the role of Oceans on the Indian south-west monsoon and its variability using Ocean variables.

Positions: Director (Retd), National Institute of Oceanography, Goa; Visiting Professor, Kerala University (1963-69).

Learned and Professional Societies: Fellow, Indian Academy of Sciences and National Academy of Sciences (India).

Author/Editor Facet: Authored a monograph on 'Oceans and Monsoon' (to be published by NIO, Goa shortly).

Policy-making Bodies: Member-Secretary, Indian National Committee for SCOR; Indian representative at General Body Meetings of Intergovernmental Oceanographic Commission (IOC) and Executive Committee meetings of IOC (1981-85); Elected Member, Scientific Review Board, IOC (1981-86); Vice-President, International Committee on Climatic Changes and the Ocean (1984-86).

Other Contributions: As Director, NIO, Goa, Varadachari played a key role in the launching of the first Indian Expedition to Antarctica in 1981 and expeditions in 1982-84.

Address: 'Kala Nivas', 11/A, Sagar Cooperative Housing Society, Dona Paula, Goa 403 004; Tel: 45508.

VARADARAJAN, Srinivasan *Elected 1983*

Born 31 March 1928; Bangalore, Karnataka
M.A., University of Madras, M.Sc., Andhra University, Watair, Ph.D. (1952), University of Delhi; Ph.D. (1956), University of Cambridge, UK; D.Sc. (*h.c.*), Indian Institute of Technology, Guru Nanak Dev University, Amritsar and Andhra University

Specialization: Organic and Biological Chemistry, Chemical Technology

Research Achievements: Varadarajan has made contributions to: structure and synthesis of natural products; structure of ribonucleic acids; synthesis of nucleotides and nucleosides; biosynthesis of nucleic acids by use of uniformly ^{14}C labelled nucleotides and conversion to nucleoside triphosphates; study of structure of several vegetable seed oils and their transformation to valuable industrial raw

materials. Varadarajan has also worked on the design of high protein efficiency ratio human food concentrates to meet nutritional requirements in drought conditions.

Positions: Chairman, Indian Vaccines Corporation Ltd. Delhi (1990-); Hony Visiting Professor, Indian Institute of Technology, Delhi (1988-90); Secretary to Government of India (1982-88); Chief Consultant, Planning Commission (1986-88), Secretary to Government of India, Department of Scientific & Industrial Research and DG, CSIR (1984-86) and Department of Science and Technology (1982-84); Chairman & Managing Director, Engineers India Ltd. (1975-78, 1981-82); Chairman & Managing Director, Indian Petrochemicals Corporation Ltd (1974-81); Chairman, Petrofils Cooperative Ltd (1975-80) and Bridge and Roof Co. (1978-83); Director, Research and Chemicals Group, Board of Hindustan Lever Ltd (1966-74); Head of Research, Hindustan Lever Ltd. (1958-74); Beit Memorial Fellow in Medical Research, University of Cambridge, UK (1957-58); Visiting Lecturer, Department of Biology, Massachusetts Institute of Technology, USA (1956-57); 1851 Exhibition Fellow, University Chemical Laboratory, Cambridge (1953-56); Lecturer in Chemistry, University of Delhi (1950- 53).

Learned and Professional Societies: President, Indian National Academy of Engineering (1992-95), Nutrition Society of India (1982-86), Indian Academy of Sciences (1980-83), Oil Technologists Association of India (1985-87); Treasurer, Materials Research Society of India (1990-94); Fellow, Royal Society of Chemistry; Hony Fellow, National Academy of Sciences (India), Society of Engineers, All India Management Association; Vice-President, INSA (1991-92).

Awards and Honours: Om Prakash Bhasin Award; Padma Bhushan (1985).

Lectureships: Founder Memorial Lecture (Shri Ram Institute for Industrial Research); Nehru Memorial Lecture (Nehru Museum) (1974); C.C. Desai Memorial Lecture (Administrative Staff College, Hyderabad); Gopalan Oration (Nutrition Society of India); Hora Memorial Lecture (Institute of Chemical Engineers); Sir Vittal Chandrasekaran Lecture (Indian Institute of Science); Gandhi Memorial Lecture (Raman Research Institute); S.S. Bhatnagar Lecture (IICT, Hyderabad); Institute of Metals Lecture (Trivandrum); Sir M. Visweswaraya Centenary Lecture (Institution of Engineers, India); ICMA Lecture, Husain Zaheer Lecture (IICT, Hyderabad), 125th Anniversary Lecture (Bengal College of Engineering); CSIR Golden Jubilee Lecture; Lal Badadur Shastri Lecture (IARI); J.G. Kane Memorial Lecture (Oil Technologists Association of India) and several others.

Policy-making Bodies: Member, National Committee on Science and Technology (1977-82); Member Secretary, Scientific Advisory Committee to Cabinet (1982-

84); Chairman/Member, Science Advisory Committees of Coal, Petroleum, Environment, Biotechnology, Ocean Development, Chemicals, Fertilizers and Energy Ministries/Department of Government of India; Member of Governing Councils of National Council of Applied Economic Research, CSIR, ICMR, IARI, IIT (Delhi and Bombay), All India Council of Technical Education, IISc, NII, and Raman Research Institute, Bangalore; Chairman, National Council of Science Museums (1981- 89); Member, CHEMRAWN Committee of IUPAC (1985- 95).

Address: 4A, Giridhar Apartments, 28, Feroze Shah Road, New Delhi 110 001; Tel: 3712512 (Res); (011) 6849095, 630499, 630255, 6830582 (Off); Fax: 91-11-6840513.

VARMA, Anupam

Elected 1987

Born 23 July 1940; New Delhi
Ph.D. (1967), University of London, UK

Specialization: Plant Virology

Research Achievements: Varma has made important contributions to both fundamental and applied aspects of plant virology. Determined the ultrastructure of a large number of flexible anisometric viruses and described distinct arrangements of protein subunits in helical symmetry. Complicated structure of a Rhabdovirus - the first of its kind to be described from India - was elucidated by him by *in situ* electron microscopy. He has also demonstrated the usefulness of electron microscopy of sections in detecting unknown viruses like the lily reovirus. Characterized many viruses and developed sensitive diagnostic methods like nucleic acid hybridization, immuno electron microscopy and serology using poly-and monoclonal antibodies; started research on mycoplasmal diseases of plants and opened up new line of research on very important diseases like sandal-spike and little leaf of brinjal. Mango malformation was a controversial problem and Varma proved the etiology of both vegetative and floral malformations. Demonstrated the correct size of meristematic tissue required for eliminating viruses by meristem culture from several cultivars of potato and horseradish. Contributed to the study of epidemiology of virus diseases and developed effective control measures.

Positions: Coordinator, Advanced Centre for Plant Virus Education and Research, and Head, Division of Mycology and Plant Pathology (1988), Professor of Plant Pathology (1984- 88), Indian Agricultural Research Institute, New Delhi; Visiting

Fellow, Research School of Biological Sciences, Australian National University, Canberra (1977); Applied Plant Virologist (FAO), Nigeria (1979-81).

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Indian Virological Society; Secretary, Indian Phytopathological Society (1983-88) and National Academy of Agricultural Sciences (India) (1990); Secretary General, International Society for Plant Pathology (1993-98).

Awards and Honours: World Food Day Award (FAO, IAAS) (1985); President, Agricultural Section, Indian Science Congress (1988- 89); Om Prakash Bhasin Award (1992); Panchanan Maheshwari Medal ((Indian Botanical Society) (1993).

Lectureships: Platinum Jubilee Lecture (Indian Science Congress) (1990); Mundkur Memorial Lecture (Indian Phytopathological Society) (1991).

Author/Editor Facet: Chief Editor, *Indian Phytopathol.*; Indian Editor, *J. Phytopathol.*; Editor, *Int. J. Trop. Plant Dis.*; member, editorial board and advisory committees of several journals relating to virology, plant pathology and agriculture; edited six books.

Policy-making Bodies: Member, International Committee on Taxonomy of Viruses (1978-81), ICAR Plant Pathology Panel (1976-79, 1985- 91), Research Council, NBRI, Lucknow (1991- 93), TOKTEN Committee, CSIR (1990-92).

Address: Professor and Coordinator, Advanced Centre for Plant Virus Education and Research and Head, Division of Mycology and Plant Pathology, Indian Agricultural Research Institute, New Delhi 110 012; Tel: (011) 581474; Res: C-33 Pusa Campus, New Delhi 110 012; Tel: (011) 5710337.

VARMA, Ram Kumar

Elected 1985

Born 31 March 1935; Sardhana, Uttar Pradesh
Ph.D. (1965), University of California, San Diego, USA

Specialization: Plasma Physics & Astrophysics, Foundations of Quantum Mechanics and Statistical Mechanics

Research Achievements: Varma's earliest work which has found frequent citation in literature is the acceleration of cosmic radiation using the concept of magnetic pumping in the presence of pitch angle scattering. His next set of important investigations relates to the behaviour of plasma as well as of charged particles in mirror-trap geometrics. The equations given for the former (named 'Varma equations' in literature) have been able to explain correctly the behaviour of mirror machine plasmas, whereas investigations on the latter problem have revealed some very astonishing quantum-like behaviour of the charged particle motion in the magnetic field.

Positions: Director (1987-), Deputy Director (1986-87), Senior Professor (1981-85), Physical Research Laboratory, Ahmedabad.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), and Astronautical Society of India; President, Plasma Society of India (1978-82); Chairman, Indian Physics Association (Ahmedabad Chapter) (1972- 74).

Awards and Honours: H.C. Shah Award and Gold Medal (1977).

Author/Editor Facet: Member, board of editors for Indian Physics Association-sponsored books; member, editorial board of *Indian J. Phys.*

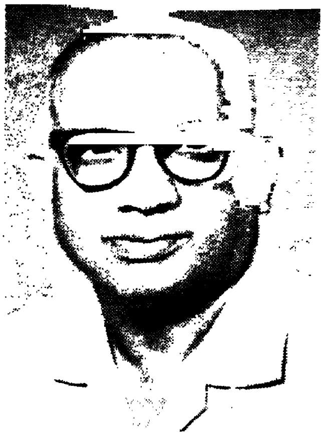
Policy-making Bodies: Chairman, Indian National Committee for Space Research.

Other Contributions: Acted as co-director for several courses/workshops of ICTP, Trieste; promoted science education and scientific temper and awareness; started an in- house magazine *Science Focus* at PRL.

Address: Director, Physical Research Laboratory, Ahmedabad 380 009; Tel: (0272) 428550, 462129; Telex: 121-6397; Fax: (0272) 460502; E-mail: varma@prl.ernet.in; Res: 303, Saraswati Nagar, Ahmedabad 380 015; Tel: (0272) 649242.

VARMA, Rama Shankar

Elected 1949



Born 1 February 1905; Nai Bazar, Uttar Pradesh
D.Sc. (1936), University of Allahabad

Specialization: Mathematics (Pure and Applied)

Research Achievements: Varma's research covered both pure and applied mathematics: functions of real variables, special functions, ordinary differential equations, Fourier analysis, integral transforms and operational calculus, fluid mechanics, aerodynamics, space dynamics, ballistics, operational research, quenching theory, theory of reliability, and information theory. On the basis of Meijer's integral, he developed in 1945 theory on generalized Laplace transform and gave a new generalization. He also gave five theorems and subsequently presented an inversion formula for his generalized Laplace transform. In 1951 he gave another generalization of the classical Laplace-Stieltjes integral which came to be known as Varma transform. This transform has been found capable of yielding very general results. In 1966 he made a detailed study of his two generalisations.

Positions: Head, Defence Science Laboratory; Professor and Head, Department of Mathematics and Mathematical Statistics (1962) and Visiting Professor, University of Waterloo, Canada.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Founder Member, *Bharat Ganita Parishad* (formerly, Benaras Mathematical Society) (President 1963-64); President, Indian Mathematical Society (1966-67, 1967-68); Founder Member, Operational Research Society; Founder President, Society for the Promotion of Mathematical Sciences; Member, Australian Mathematical Society, American Mathematical Society, and Operations Research Society of America.

Awards and Honours: President, Mathematics Section, Indian Science Congress (1961).

Died 31 March 1970.

VASUDEVA, Raghunath Sahai

Elected 1950

Born 10 February 1905
D.Sc., University of London, UK

Specialization: Mycology

Research Achievements: Vasudeva was known for his work on crop diseases, especially diseases of apple and onion, root rot disease of cotton and viral diseases of cotton, cowpea, cucurbits and tomato.

Positions: Joint Director and Head, Division of Mycology and Pathology, Indian Agricultural Research Institute, New Delhi; Agricultural Adviser to FAO.

Died 4 February 1987.

VENKATARAMAN, Ganesan

Elected 1977

Born 6 October 1932; Madurai, Tamil Nadu
Ph.D. (1966), Bombay University

Specialization: Condensed Matter Physics

Research Achievements: Venkataraman has carried out studies in neutron scattering, lattice dynamics, mechanical properties of matter, non-crystalline state, neutral networks and image processing.

Positions: Director, Physics, Electronics and Instrumentation Group, Indira Gandhi Centre for Atomic Research, Kalpakkam; Director, ANURAG, Defence Research and Development Organization; Distinguished Scientist, DRDO.

Learned and Professional Societies: Fellow, Indian Academy of Sciences and Materials Research Society of India.

Awards and Honours: Sir C.V. Raman Award (UGC) (1979); Jawaharlal Nehru Fellowship (1984-86); Padma Shri (1991).

Author/Editor Facet: Served on editorial board of *Pramana.*

Other Contributions: Worked for technology transfer to computer industry and advanced VLSI design and fabrication.

Address: Department of Physics, Sri Sathya Sai Institute of Higher Learning, Prasantinilayam, Anantpur, Andhra Pradesh; Tel: 515134.

VENKATARAMAN, Gopalasamudram Sitaraman

Elected 1981

Born 1 February 1930; Tenkasi, Tamil Nadu
D.Sc. (1971), Banaras Hindu University, Varanasi

Specialization: Microbiology/Phycology

Research Achievements: Venkataraman has developed algal biofertilizer technology for rice to harness the natural renewable biological nitrogen-fixation process through blue-green algal systems. His work has led to our understanding of the ecobiology of blue-green algae in crop production ecosystems. His work has shown, contrary to the general belief, that nitrogen- fixing blue-green algae do not seem to be invariably present in all tropical rice soils, although recurrent combinations of algal species may occur in comparable habitats.

Positions: Director, DBT Centre for Blue-Green Algae, Madurai Kamaraj University, Madurai (Currently); Joint Director (Research), Indian Agricultural Research Institute, New Delhi (1986-90); Project Director, NFBGA, IARI, New Delhi.

Learned Societies: Fellow, Indian Academy of Sciences, and National Academy of Sciences (India).

Awards and Honours: UGC National Lecturer (1986); Om Prakash Bhasin Award (1988); Sanjay Gandhi Award (1982); VASVIK Award (1978); Alagappa Gold Medal (1951); Padma Shri (1992).

Lectureships: Professor Panchanan Maheshwari Memorial Lecture (INSA); Professor V. Bharadwaja Memorial Lecture.

Author/Editor Facet: Editor of Publications, INSA (1983-86); member of editorial boards of: *Bioresour. Technol.*, *Phykos*, and *J. Microbiol. Technol.*

Policy-making Bodies: Served as Member, Policy Advisory Committee on N-Fixation; IRRI, Philippines (1975-77), and many scientific bodies of DBT, DST, DOD, etc; Short-term Consultant to FAO (1977).

Address: Director, DBT Centre for BGA Biofertilizers, School of Biological Sciences, Madurai Kamaraj University, Madurai 625 021, Tamil Nadu; Tel: (0452) 85692 (Off); (0452) 85643 (Res); Telex: 445 308 MKU IN.

VENKATARAMAN, Krishnaswami

Elected 1939

Born 7 June 1901
Ph.D., D.Sc., University of Manchester, UK

Specialization: Organic Chemistry

Research Achievements: Venkataraman made seminal contributions to technical chemistry particularly synthesis of acacetin groups, work on oxycellulose and hydrocellulose antiseptics and anthelmintics and several other chemical processes of industrial potential. The Baker-Venkataraman transformation was a landmark achievement in synthetic organic chemistry, which was later studied in detail by T.S. Wheeler.

Positions: Reader, Technical Chemistry, Department of Chemical Technology, University of Bombay (1935-38); Professor of Organic Chemistry, Forman Christian College, Lahore (1929-34); Mody Professor of Chemical Technology and Director, Department of Chemical Technology (1938); Director, National Chemical Laboratory, Pune.

Learned and Professional Societies: Fellow, Institution of Chemists (India), Indian Academy of Sciences, Royal Society of Chemistry (London), Chemical Society (London), and Indian Chemical Society; Associate, Institute of Chemical Engineers.

Lectureships: Professor T.R. Seshadri 70th Birthday Commemoration Lecture (1975).

Other Achievements: Venkataraman shaped NCL into one of the world's leading centres of chemical research encompassing all its branches but especially dyestuff chemistry, as he did at UDCT, Bombay.

Died 12 May 1981.

, Sir. Tiruvadi Sambasiva

Foundation Fellow

Born June 1884
M.A., University of Madras; D.Sc. (*h.c.*), Andhra University

Specialization: Agriculture

Research Achievements: Venkataraman made acknowledged contributions to sugarcane research and development in India. He saved the first batch of sugarcane seedlings raised in the country from destruction. Raised the hybrid seedlings (*S. officinarum x S. spontaneum*) under ordinary field conditions and spotted a few quite unlike any ordinary grass seedlings. He pioneered the study of the root system of the sugarcane crop. By simple, unorthodox techniques using earthen pots and glass bangles for supporting the sugarcane set, he was able to show that studies on root system could be conducted in detail and that varieties with desirable root system isolated for use in breeding. Made observations on flowering of varieties, fertility of pollen, artificial culture of pollen, viability of hybrid seed, etc., recorded and coded them for use in the hybridisation programme.

Positions: Indian Agricultural Service: Government Sugarcane Expert, Sugarcane Breeding Station, Coimbatore.

Learned and Professional Societies: Member, International Genetics Congress Association, Indian Society of Genetics and Plant Breeding (President), and International Society of Sugarcane Technologists.

Awards and Honours: *Rao Sahib* (1920); *Rao Bahadur* (1928); President, Agricultural Section (1928) and General President (1935), Indian Science Congress; CIE (1937); 'Wizard of Sugarcane' Honour (International Genetics Congress, Edinburgh) (1939); Knighted (1942); Portrait Presentation on Golden Jubilee of Sugarcane Breeding Institute, Coimbatore; Padma Bhushan (1956).

Died January 1963.

VENKATESACHAR, Bachalli

Foundation Fellow

Born 18 June 1879; Chikkaballapur, Karnataka
M.Sc (1900), University of Madras

Specialization: Physics, Spectroscopy, Philosophy

Research Achievements: Venkatesachar was an experimental spectroscopist whose work centred, however, on the theoretical ideas of Bohr's old quantum theory. His work comprised essentially (i) analysis of atomic spectra, (ii) Raman effect and (iii) hyperfine structure of spectral line in relation to nuclear structure. He determined the isotopic contribution and the nuclear spins of the elements platinum, iridium and gold, which had for a long time resisted the attmpts of Aston and others to obtain their isotopic contribution by means of a mass spectrograph.

Positions: Professor of Physics, University of Mysore; Acting Director, Indian Institute of Science, Bangalore (1937-39); Principal, Central College, Bangalore (1930) and Vijaya College, Bangalore (1945-51); Vice-Chancellor, *Purna Prajna Vidyapeeth.*

Learned and Professional Societies: Fellow, Institute of Physics (London).

Awards and Honours: President, Physics Section, Indian Science Congress (1930); *Rao Bahadur* (1930).

Other Contributions: Venkatesachar was not just a scientist. He was a philosopher of the Renaissance times. An exponent of both monistic and dualistic doctrines, he made intensive studies in *Vedanta*. Headed IISc during its turbulent times. Founded an undergraduate college in Bangalore, where he taught not physics but trignometry and Sanskrit.

Died 27 May 1972.

VENKATESAN, Kailasam *Elected 1989*

Born 29 April 1932; Madras, Tamil Nadu
Ph.D. (1989), University of Madras

Specialization: Chemical Crystallography

Research Achievements: Venkatesan has carried out incisive studies on photodimerization reactions in crystals and obtained valuable information on the conditions for photodimerization in crystals. Also carried out comprehensive studies on crystal engineering, on thermally induced reactions in crystals and on the significance of thermal motions of chemical groups undergoing migration in crystals.

Positions: INSA Senior Scientist (1992-), Department of Organic Chemistry, Indian Institute of Science, Bangalore.

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Author/Editor-Facet: Co-edited 'Computing a Crystallography'.

Policy-making Bodies: Served as member of International Commission of IUCr on Crystallographic Computing.

Other Contributions: Has taken interest to teach crystallography for M.Sc. students in universities and to teachers in colleges.

Address: Department of Organic Chemistry, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2578); E-mail: ockven@orgchem.iisc.ernet.in; Res: E-22 Staff Quarters, IISc Campus, Bangalore 560 012.

VENKATESH, Yedatore Venkatakrishnaiya *Elected 1992*

Born 20 May 1942; Mysore, Karnataka
Ph.D. (1970), Indian Institute of Science (IISc), Bangalore

Specialization: System Theory and Control Systems, Remote Sensing, Signal Processing and Vision, Neural Networks for Vision

Research Achievements: For classes of linear and nonlinear, time- varying feedback systems (both continuous and discrete), Venkatesh has derived the most general L_2 - and L_p- ($p \geq 2$) stability and instability conditions, invoking some new differential/integral and norm inequalities. In signal processing including image - processing), he has worked out a novel framework involving generalized Hermite polynomials for: (i) reconstruction of signals from partial information, like zero-crossings or phase, and (ii) representation of signals at multiple resolutions, using an array of wavelets.

Positions: Professor and Chairman, Department of Electrical Engineering, IISc, Bangalore (currently); Visiting Professor, Institute for Mathematics, Technical University of Graz, Graz, Austria; Visiting Faculty, Asian Institute of Technology, Bangkok (1990); Visiting Fellow, Research School of Biological Sciences, Australian National University, (1991); Senior National Research Council (USA) Fellow.

Learned Societies : Fellow, Indian Academy of Sciences; and National Academy of Sciences (India).

Author/Editor Facet: Authored a monograph 'Energy Methods in Linear and Non-Linear Time Varying System Stability and Instability Analyses' (Springer-Verlag); Member, editorial board, *J. Indian Rem. Sens.*

Address: Professor and Chairman, Department of Electrical Engineering, Indian Institute of Science, Bangalore 560 012; Tel: (080) 341566; Fax: 91-80-341683; E-mail: yvv@vigyan.iisc.ernet.in; Res: E-24, New Housing Colony, IISc, Bangalore 560 012.

VENKATESWARLU, Jillella

Elected 1961

Born 21 March 1912; Komaragiripatnam,
Andhra Pradesh
D.Sc. (1946), Andhra University; Ph.D. (1951),
University of Cambridge, UK

Specialization: Plant Embryology and Cytogenetics

Research Achievements: Venkateswarlu studied chromosomal behaviour in autotetraploid maize, and embryological phenomena in *Oenothera blandina* de Vries, a deficiency- duplicate heterozygote. His chief contributions were in plant embryology and plant cytogenetics. First to describe the cell lineages in embryogeny, he was also a pioneer in angiosperm embryology in India. In cytogenetics, he and his students were the first to map the pachytene chromosomes of several crop plants like sorghum, pearl millet, job's tears, solanums, tomatillo, mustards, brassicas and several fodder grasses. This work is of much significance both for the understanding of the genome relationships and for its potential to crop improvement. Coming into contact with R.A.Fisher, he learnt the importance of the statistical approach to cytogenetic problems.

Positions: Professor and Head, Department of Botany, Principal, College of Science and Technology (1968-71) and Chairman, Faculty of Science (1969-72), all at Andhra University, Waltair; Emeritus Scientist, Indian Council of Agricultural Research (1972-75); UGC Research Scientist (1975-78); Fulbright Fellow and Visiting Professor, Department of Genetics, University of Wisconsin, USA (1973-74).

Learned and Professional Societies: Fellow, Indian Botanical Society (President, 1962) and Indian Academy of Sciences; Founder Fellow, Andhra Pradesh Academy of Sciences (Vice- President, 1971-74); Member, Indian Society of Cytology and Genetics (Founder President, 1966-67); Member, INSA Council (1966-68).

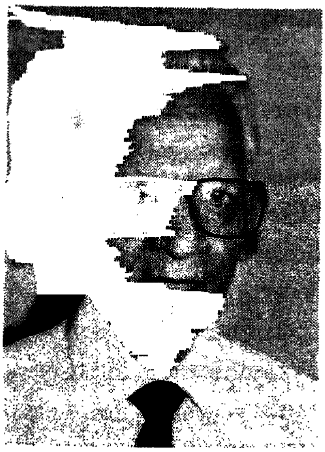
Awards and Honours: President, Botany Section, Indian Science Congress (1962); Birbal Sahni Memorial Gold Medal (1971); Bashambarnath Chopra Lecture Award (INSA) (1974).

Author/Editor Facet: Co-authored two books: 'An Introduction to Agriculture in India' (Asia Publishing House) and 'Flora of Vishakhapatnam' (Andhra Pradesh Academy of Sciences).

Died 20 May 1978.

VENKATESWARLU, Putcha

Elected 1970



Born 25 October 1921; Dantaloor, Andhra Pradesh
D.Sc. (1947), Banaras Hindu University, Varanasi

Specialization: Optics, Spectroscopy

Research Achievements: Venkateswarlu has obtained extensive results in halogen spectra. He was the first to observe a bent triatomic free radical (CF_2) through its emission spectrum. First to predict dipole moment and microwave transitions in excited states of T_d and D_{2d} type molecules. Obtained extensive results in EPR, NMR, microwave spectra, laser excited flourescence, energy transfer and energy up-conversion in rare earth ion-doped crystals, nonlinear optics and optical phase conjugation.

Positions: Professor, Department of Physics, Alabama A & M University, Normal, USA (1982-); Visiting Professor, Department of Chemistry, Lousiana State University, USA (1982); Visiting Research Officer, Herzberg Institute of Astrophysics, National Research Council (NRC)of Canada, Ottawa (1976-77); Visiting Professor in Chemistry, University of Bristish Columbia, Canada (1972-73); Visiting Scientist, Division of Pure Physics, NRC of Canada, Ottawa (1967-68); Professor, Department of Physics, Indian Institute of Technology, Kanpur (1961-82).

Learned and Professional Societies: Fellow, Indian Academy of Sciences.

Awards and Honours: C.V. Raman Centenary Medal Award (1988).

Policy-making Bodies: Member, CSIR Physical Research Committee (1961-74); also served as member of several UGC committees.

Other Contributions: Developed laboratories for working in vacuum UV to radiofrequency region, laser spectroscopy, EPR, NMR, microwave spectroscopy, nonlinear optics and optical phase conjugation.

Address: Professor, Department of Physics, Alabama A & M University, Normal (Huntsville), AL 35762, USA; Tel: (205) 8515312; Fax: (205) 8515622.

VENKITESHWARAN, Sekharipuram Padmanabhier

Elected 1955

Born 15 February 1905; Palghat, Kerala
M.A., University of Madras

Specialization: Earth Sciences including Instrumentation

Research Achievements: Venkiteshwaran's research covered a wide spectrum - from agricultural meteorology to cloud physics, and from climatology to atmospheric electricity, although the thread linking his different fields of interest was instruments and methods of observation. In addition to the design and development of a variety of meteorological instruments, Venkiteshwaran carried out upper atmospheric research. Pioneered the study of atmospheric electricity in the free atmosphere and developed the potential gradient sonde and the conductivity sondes in the early fifties. He also made important contributions to radar studies of rain, for the first time in the country.

Positions: Director (1953-59) and Deputy- Director General of Observatories (1959-60), India Meteorological Department; Assistant Director, National Aerospace Laboratory, Bangalore; Technical Advisor, Radio Refractive Index Project, Tata Institute of Fundamental Research, Bombay.

Learned and Professional Societies: Fellow, Indian Academy of Sciences; Member, Institution of Electronics and Telecommunication Engineers (India) and Aeronautical Society of India.

Awards and Honours: Meghnad Saha Award (INSA) (1972); S.K. Mitra Award (Institution of Electronics and Telecommunication Engineers, India) (1972).

Died 26 September 1985.

VENKOBA RAO, Antapur

Elected 1989

Born 20 August 1927; Kavutalam, Andhra Pradesh
D.Sc. (1978), University of Madras

Specialization: Psychological Medicine

Research Achievements: Venkoba Rao has done important researches in affective disorders (specially depressive disease), psychiatry of old age, suicidology, clinical use of lithium, biological psychiatry, especially melatonin studies in depression; psychotherapy based on *Gita* and other Indian scriptures; and history of psychiatry with reference to Ayurveda and Indian philosophical systems.

Positions: Emeritus Professor of Psychiatry (1985-);
Officer-in-Charge, Indian Council of Medical Research, Centre for Advanced Research on Health and Behaviour, Madurai (1985-, 92); Professor and Head, Institute of Psychiatry, Madurai Medical College, Madurai (1962-85); Visiting Scientist, National Institute of Mental Health, Bathesda, USA (1986).

Learned and Professional Societies: Fellow, National Academy of Medical Sciences (India), Royal College of Psychiatrists (London), American Psychiatric Association, Royal Australian and New Zealand College of Psychiatrists, Indian Academy of Sciences, Canadian Association of Psychiatrists, International Association for Suicide Prevention, Indian Psychiatric Association (Life Fellow), and Indian Academy of Neurology; President, Association of Gerontology, India (1990-92); Member, World Psychiatric Association; Founder President, Indian Association for Social Psychiatry.

Awards and Honours: J.C.Marfatia Award (1972,1975,1979), D.L.N. Murti Rao Oration Award (1980), and Sandoz Award (1974) (all of Indian Psychiatric Society); Sandoz Oration Award (University of Edinburgh) (1984); P.N Raju Oration Award (1975); M.N.Sen Oration Award (1983) and M.K.Seshadri Prize and Gold Medal Award (1987) (all of ICMR); Sir Shriram Memorial Oration Award (1983) and R.V Rajam Oration Award (1991-92) (both of NAMS, India); Dr. B.C.Roy National Award (Medical Council of India) (1981); May & Baker Oration Award (Geriatric Society of India) (1990); Dr. N.N.De Oration Award (1991); Academy of Medical Specialities Award (1989-90).

Lectureships: Madurai Kamaraj University Endowment Lecture (1970,1973); Girindrasekar Bose Lecture(1979).

Author/Editor Facet: Authored/co-authored three books: 'Depressive Disease' (ICMR), 'Lithium' and 'Psychiatry of old Age in India'; editor, *Indian J. Psych.* (1971-77); and a few more journals.

Policy-making Bodies: WHO Consultant on Psychiatric Diseases (1980); Tamil Nadu Prison Reform Commission, National Committee to study the extent of drug addiction in India (1976).

Other Contributions: Contributed to the science of suicidology, Crisis intervention, lithiumology and evolving a model for total health care of the rural aged.

Address: 'Tilak', No. 506, K.K. Nagar, Madurai 625 020; Tel.: (0452) 41496.

VERMA, Ajit Ram

Elected 1963

Born 20 September 1921; Lucknow, Uttar Pradesh
Ph.D. (1952), D.Sc. (1969), University of London, UK

Specialization: Solid State Physics, Crystal Growth and Defects, Interferometry

Research Achievements: Utilizing phase contrast microscopy and multiple-beam- interferometry, Verma studied (1950) unimolecular growth spirals on SiC, explaining crystal growth by screw dislocation mechanism and the phenomenon of polytypism. He showed (i) the unimolecular nature of Blodgett-Langmuir films; (ii) by X-ray diffraction that vapour-grown whiskers have no axial screw dislocation; (iii) that the diffuse X-ray scattering is due to point defects and not phonons. Investigated anomalous X-ray diffraction by natural diamond crystals.

Positions: Visiting Professor, Indian Institute of Technology, Delhi; Director, National Physical Laboratory, New Delhi; Professor and Head, Physics Department, Banaras Hindu University, Varanasi.

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Indian Academy of Sciences; Founder Member and Vice-President, Society for Scientific Values; Treasurer (1973- 76) and Foreign Secretary (1977-80), INSA.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1964); Jawaharlal Nehru Fellowship; Padma Bhushan (1982).

Author/Editor Facet: Authored two books: 'Crystal Growth & Dislocations'and 'Polymorphism and Polytypism in Crystals' (translated into Russian); charter member, board of editors, *Solid St. Commun.*

Policy-making Bodies: Elected Member, International Committee on Weights and Measures (1966-82).

Address: Emeritus Scientist, National Physical Laboratory, New Delhi, 110 012; Tel: (011) 5782721; Res: A-160 DEEPALI, Pitampura, Delhi 110 034; Tel: (011) 7273574.

VERMA, Jeevan Prakash

Elected 1990

Born 6 May 1939; Kauraha, Uttar Pradesh
Ph.D. (1961), University of Lucknow; Dr. rer.nat. (1966), Munich University, Germany

Specialization: Plant Bacteriology, Cotton Pathology, Agriculture

Research Achievements: Verma has studied the interaction of host and pathogen genotypes; demonstrated cross protection, occurrence of mixed pathogen genotypes (races) in single lesions, and generation of more virulent genotypes in nature. His data on apoplastic movement of chemicals, mutation rates, positive/negative cross resistance, pathogen gene distribution under natural selection pressures, useful host-gene combinations, biochemical resistance, bio-degradation of antibiotics, plasmid profiles, siderophores and biological control have generated useful concepts in ecological plant pathology. He has also made contributions to our understanding of inheritance of resistance, enzymes, latency, bacteriophages and lysogeny.

Positions: Professor, Division of Mycology and Plant Pathology, Indian Agricultural Research Institute, New Delhi.

Learned Societies: Fellow, National Academy of Sciences (India); Foundation Fellow, National Academy of Agricultural Sciences (India), Indian Phytopathological Society (President- elect, 1993), Indian Botanical Society; President, Agricultural Sciences Section, Indian Science Congress (1990).

Awards and Honours: Hexamar Award (1981, 1991); ICAR Commendation Gold Medal (1992).

Lectureships: Platinum Jubilee Lecture (Indian Science Congress) (1991-92); Mundkur Memorial Lecture (Indian Phytopathological Society) (1991-92).

Author/Editor Facet: Authored/co-authored 'Bacterial Blight of Cotton' (CRC Press), 'The Bacteria' and 'General Bacteriology'; served as chief-editor/editor, *Indian Phytopathol.;* edited/co-edited several books.

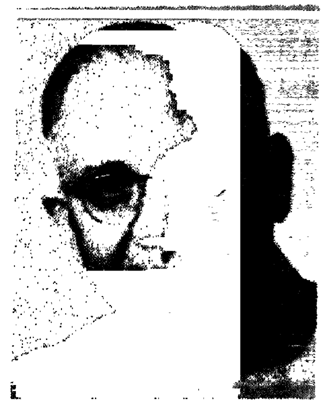
Address: Professor, Division of Mycology and Plant Pathology, Indian Agricultural Research Institute, New Delhi 110 012; Tel: (011) 5788418; Telex: 031-77161 IARI IN; Fax: 91-5740722/5752006; Res: G 2/2, SFS Flats, Narayana Vihar, New Delhi 110 028; Tel: (011) 5447944.

VERMAN, Lal Chand

Elected 1946

Born 3 September 1902; Amritsar, Punjab
Ph.D. (Engng) (1930), University of Michigan, USA

Specialization: Engineering, Standardization



Research Achievements: Verman's major contribution to Indian science/technology/industry is the introduction of standardization in industry. He was responsible for introducing metric system of weights and measures in India and establishing the Indian Standards Institution (now Bureau of Indian Standards). In order to ensure that the ISI mark on an article provides the necessary quality, Verman set up well-equipped laboratories for chemicals, textiles and electrical, structural and metallurgical products. A man of great farsight, Verman laid down all the needed safeguards. Introduced, in 1958, a comprehensive training scheme to attract young scientists and engineers to turn out 'Standards Engineers'.

Positions: Assistant Director, Board of Scientific and Industrial Research (1940-44); Director, National Physical Laboratory, New Delhi (1944-46); Director-General, Indian Standards Institution (1946-66); Chief Adviser to the Director-General, Institute of Standards and Industrial Research of Iran (1966-67); Senior Regional Adviser for Industrial Standardization to ECAFE (now ESCAP), UNIDO (1967-69); Industrial Consultant, Government of Algeria (1970); Project Leader, USAID Project Team for the Study of National Standards System, South Korea (1974-75).

Learned and Professional Societies: Fellow, Institution of Engineers (India), Institution of Electronics and Telecommunication Engineers (President, 1960-62), and Standards Engineers Society (USA); First Asian Vice- President, International Standards Organization (1949-54).

Awards and Honours: K.L. Moudgill Prize (1958); Leo B. Moore Award (Standards Engineers Society, USA) (1964); Sir Walter Puckey Prize (1966); President, Indian Science Congress (1969- 70); Padma Shri (1967).

Author/Editor Facet: Authored a book 'Standardization- A New Discipline' (East-West Press, 1973); co-edited 'Metric Change in India (Indian Standards Institution, 1970).

Died 21 October 1979.

VIG, Om Prakash

Elected 1973

Born 1 November 1924; Gharota, Punjab
Ph.D. (1956), Panjab University, Chandigarh

Specialization: Synthesis of Natural Products

Research Achievements: Vig's contributions relate to total synthesis of natural products including terpenoids, juvenile hormones and some alkaloids. He has synthesized for example: a large variety of terpenoids, acyclic, monocyclic, mono, sesqui- and diterpenoids, e.g. -myrecene, sabinene, carvone, β-elemene, humulene, cubitene, khusitene, fokienol, crytonerion, α and β -farnesenes, naceferal, ε γ_1 γ_1 cadinenes, artinesene, γ-bisabolene, rosefurane and sesquirose furane etc.

Positions: Professor and Head, Department of Chemistry, Panjab University, Chandigarh.

Awards and Honours: Acharya J.C. Ghosh Gold Medal (1979); T.R. Govindachari 60th Birthday Award (University of Madras) (1982); UGC National Lecturer (1978-79).

Address: Professor Emeritus, Department of Chemistry, Panjab University, Chandigarh 160 014; Tel: (0172) 25035; Res: 161, Sector 8, Panchkula, Haryana.

VIJAYAN, Mamannamana

Elected 1987

Born 16 October 1941; Cherpu, Kerala
Ph.D. (1967), Indian Institute of Science (IISc), Bangalore

Specialization: Molecular Biophysics, Biological Crystallography

Research Achievements: Vijayan determined the three- dimensional structure of lectins. Developed new approaches to the understanding of the plasticity of proteins and characterization of additional binding sites in lysozyme. Elucidated the geometrical features of several biologically and evolutionarily important interactions and aggregation patterns using a novel approach involving crystalline complexes of amino acids and peptides. Also elucidated the structure and interactions of drug molecules and ionophores.

Positions: Chairman, Molecular Biophysics Unit, IISc, Bangalore (1985-92).

Learned and Professional Societies: Fellow, National Academy of Sciences (India), Indian Academy of Sciences, Society of Biological Chemists, India (Vice-President, 1986-88); Indian Biophysical Society (President, 1993-); Member, Guha Research Conference.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1985); ASTRA Professor, IISc (1991-).

Author/Editor Facet: Co-editor, *Acta Crystallograp.* (1993-); editor, *J. Indian Inst. Sci.* (1987-92).

Policy-making Bodies: Member, IUCr Commissions on Biological Macromolecules (1987-), Small Molecules (1984-90) and Journals (1993-); Member, IUPAB Commission on Education and Development in Biophysics (1990-); Coordinator, UGC Curriculum Development Centre in Biophysics (1986-91); Chairman, National Committee for IUPAB (1991-); Member, Kerala State Committee on Science and Technology (1981-84, 1991-); Member, research advisory committees of several institutions.

Other Contributions: Developed at IISc a school in biological macromolecular crystallography which served as a national nucleus for development of this area.

Address: Professor, Molecular Biophysics Unit, Indian Institute of Science, Bangalore-560 012; Tel: (080) 344411 (Ext 2389), 346765; Telex: 0845-8349 IISC IN; Fax: 91-80- 341683; E-mail: mv@mbu.iisc.ernet.in; Res: 195 (Old No. 49/7), 16th Cross, 4th Main, Malleswaram, Bangalore 560 055; Tel: (080) 340031.

VIJAYA RAGHAVACHARYA, Sir T. *Foundation Fellow*

Born August 1875

Positions: Madras Provincial Service (1898); Revenue Officer, Madras Corporation (1912-17); Secretary, Board of Revenue (1917- 18); Director of Land Records (1918); Deputy Director of Industries (1918-19); Dewan of Cochin (1919-32); Collector and District Magistrate (1920); Commissioner for India, British Empire Exhibition (1922-25); Member, Legislative Assembly (1925- 26); Director of Industries (1926); Director of Fisheries (1926); Member, Public Service Commission (1926-29); Vice-Chairman, Imperial Council of Agricultural Research (1929-35); Chairman, Madras Government Committee on Cooperation (1939); Prime Minister, Mewar State (1939).

Awards and Honours: KBE; *Diwan Bahadur*

Other Contributions: A renowned administrator Vijaya Raghavacharya served the Indian government in various fields like agriculture and industries and made notable contributions in whatever capacity he worked.

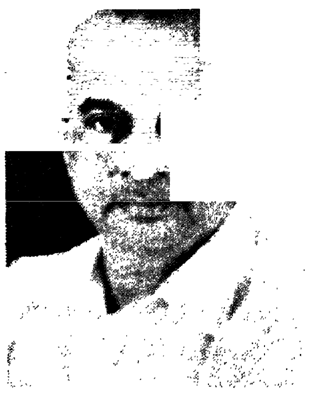
Died (Date N.A.)

VIJAYARAGHAVAN, Ramanuja *Elected 1980*

Born 3 January 1931; Ramanathapuram, Tamil Nadu
Ph.D. (1961), University of Bombay

Specialization: Solid-State Physics and Materials Science

Research Achievements: Vijayaraghavan's group was the first to show that the local properties like hyperfine filed at the nucleus can be correlated to a bulk property like susceptibility. Similarly, the nature of conduction polarization in rare-earth alloys was found to be oscillatory, by studying the hyperfine fields at inequivalent sites. These results had great implications in understanding rare earth



magnetism. Their work in spin glass showed that there are magnetic clusters in a nonmagnetic matrix and each cluster had its own freezing temperature. In all their studies, they used both the bulk techniques like susceptibility, resistivity, magnetization, etc and local probes like NMR, EPR, Mössbauer effect and neutron diffraction to understand one fundamental property of the system. Their group was the first to study a valence fluctuating system like $CeSn_3$ and this study led to other interesting systems of cerium, europium and other systems. Many of these alloys were internationally called TIFR alloys in recognition of the pioneering work done in this area. Some interesting heavy fermion systems were synthesized and their properties were modified by suitable alloying. An alchemy in converting a valence fluctuating system-Heavy Fermion system- magnetically ordered system became the focus of attention of Vijayaraghvan's group.

Positions: Distinguished Professor & Dean, Tata Institute of Fundamental Research, Bombay.

Learned and Professional Societies: Fellow, Indian Academy of Sciences, National Academy of Sciences (India), and Maharashtra Academy of Sciences.

Awards and Honours: Shanti Swarup Bhatnagar Prize (1976); Hari Om Award (1983); Sir C.V. Raman Award (1983).

Author/Editor Facet: Member, editorial board, *Indian J. Pure Appl. Phys.*

Policy-making Bodies: Member, IUPAP (1975-81).

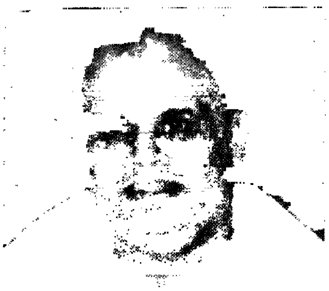
Address: Distinguished Professor, Tata Institute of Fundamental Research, Homi Bhabha Road, Colaba, Bombay 400 005; Tel: (022) 2152971 (Ext 327); Res: 209, Colaba Housing Colony, Homi Bhabha Road, Bombay 400 005; Tel: (022) 2152722.

VIJAYARAGHAVAN, Tirukannapuram

Foundation Fellow

Born 30 November 1902, Adoor Agaram, Tamil Nadu
D.Phil. (1928), University of Oxford, UK

Specialization: Pure Mathematics



Research Achievements: Vijayaraghavan worked on the set of limit points of the set $\{\phi(n)/n\}$ on Tauberian theorems of the pre-Wienerian variety, and his first contribution consisted of a simplified proof of R. Schmidt's theorem on Abel means, converse theorems on summability (of series with real terms) when the sums are infinite instead of being finite as usual. He also did much work on continued fractions. His paper on diophantine approximation arose out of the famous memoir on the Hardy and Littlewood. Vijayaraghavan showed that the analogue of Borel's theorem, for equations of higher order, was false, and that, even in the case of first-order equations, it would be false if the restriction that the solution should be real was not imposed. His next major interest was the study of the fractional parts of powers of real numbers.

Positions: Professor, Andhra University (1946-49) and Director (1949), Ramanujan Institute of Mathematics; Reader, University of Dacca (1931-46).

Learned and Professional Societies: President, Indian Mathematical Society; Member, London Mathematical Society and American Mathematical Society.

Died 20 April 1955.

VIRK, Daljit Singh

Elected 1993

Born 25 August 1944
Ph.D. (1976), D.Sc. (1991), University of
Birmingham, UK

Specialization: Genetics and Plant Breeding - Millet Breeding

Research Achievements: Virk has contributed to the understanding of quantitative genetics of *Nicotiana*, wheat, pea, and pearl millet. His contributions also relate to: new biometrical models of mating designs, genotype-environment interaction and induced variation; induction of matromorphy; cytoplasmic differentiation; and development of five varieties and 14 male sterile lines of pearl millet.

Positions: Professor and Senior Millets Breeder cum Head of Millets Section, Department of Plant Breeding (1980-), Associate Professor of Genetics (1978-80), all at Punjab Agricultural University, Ludhiana; Fellow, Royal Commission for the Exhibition of 1851 (London) in Genetics, University of Birmingham, UK.

Learned and Professional Societies: Fellow and Chartered Biologist, Institute of Biology (London); Fellow, Indian Society of Genetics and Plant Breeding, Crop Improvement Society of India, and National Academy of Agricultural Sciences (India).

Awards and Honours: Professor M.J. Narasimhan Academic Merit Award (Indian Phytopathological Society) (1982); Alumni Association Honours (College of Agriculture, PAU) (1983, 1991, 1993); Silver Jubilee Plaque (All India Coordinated Pearl Millet Improvement Project Workshop) (1983); Memento (All India Coordinated Pearl Millet Improvement Project Workshop) (1989); Honour by Plant Breeding Association, PAU, (1991).

Author/Editor Facet: Authored/co-authored: 'A Hand-Book for Pearl Millet Workers' (PAU and Directorate of Millets, 1982), 'Genotype-environment Interaction-Its Measurement and Significance in Plant Breeding' (PAU, 1987), 'Measurement and Utilization of NON-Allellic Interactions in Plant Breeding' (Crop Improvement Society of India, PAU, 1991); co-edited three symposium volumes; editor of *Crop Improv.*

Address: Professor, Department of Plant Breeding, Punjab Agricultural University, Ludhiana 141 004; Tel: (0161) 51960 (Ext 224); Telex: 386-473 COAE IN; Fax: 91-161- 51794; Res: 123 D, Kichlu Nagar, Ludhiana 141 001.

VISHWA NATH

Elected 1940

Born 9 July 1897; Amritsar, Punjab
Ph.D (1925), Sc.D. (1957), University of Cambridge, UK

Specialization: Zoology

Research Achievements: Viswa Nath worked on the reproductive organs of scorpions and mosquitoes under James Gray of Cambridge. He studied in great detail cell biology and his work on spermatid and the sperm of the crab (*Paratelphusa spinigera*) and prawn (*Palaemon lamarrei*) is well known. He demonstrated, for example, that the spermatozoon explodes at the time of fertilization and that its weird form gets transformed into that of a typical one. He also suggested that, just as in the case the crab, the cytoplasmic vesicle of the prawn sperm also provides the mechanism for its explosion during fertilization.

Positions: Professor of Zoology, Mahindra College, Patiala; Professor of Zoology, Government College, Lahore (1942-47); Principal, Government College, Dharamsala (1947); Principal, Government College, Hoshiarpur (1948-52); Professor of Zoology, Panjab University (1952-59) and University of Jodhpur (1963-65).

Learned and Professional Societies: Fellow, Royal Microscopical Society (London).

Awards and Honours: Joy Govinda Law Memorial Gold Medal (Asiatic Society) (1968); President, Zoology Section, Indian Science Congress (1944).

Author/Editor Facet: Authored 'Zoology for Intermediate Students' and 'The Decapod Sperm'.

INSA has instituted 'Viswa Nath Memorial Lecture'.

Died 19 December 1976.

VISWANATH, Bagavatula

Foundation Fellow

Born 1 January 1889; Vizianagaram, Andhra Pradesh

Specialization: Agricultural Science and Technology

Research Achievements: Viswanath's studies covered a wide range of subjects: soil science, fertilizers, plant and animal nutrition, sugarcane research and economic utilization of agricultural products and wastes. He prepared the first Soil Map of India in collaboration with others. Developed methods for industrial utilization of agricultural wastes. Demonstared on a pilot-plant scale that malt could be produced from millet *cholam (Andropogon sorghum* Brot.), active carbon from pady husk (for decolouring cane juice and for purifying vegetable oils and drinking water), and synthetic rubber from indigenous raw materials. His work on *cholam* led to a very useful commercial application of starch for sizing. He developed and designed an apparatus for extracting juice from live sugarcane. The top/bottom ratio method of determining the maturity of sugarcanes was the result of his extensive research.

Positions: Chemist and Agent-in-charge, Kopakka Graphite Mine, Foundry and Workshop; Chemical Assistant, Agricultural College and Research Institute, Coimbatore (1912); Assistant Chemist, Government of Mesopotamia (1919-21); Assistant Agricultural Chemist (1921), Chief Chemist (1922), Imperial Agricultural Chemist (1934), Joint Director (1935), Director (first Indian), Pusa Institute (1935-44), Imperial Institute of Agricultural Research, Pusa; Head, Institute of Agricultural Research and Irwin Professor of Agricultural Science, Banaras Hindu University (1948); Director of Agriculture and Food Commissioner of Rajasthan (1949); Hony Regional Agricultural Production Commissioner and Secreatry, Board of Agriculture Research, Ministry of Food and Agriculture (1950-51).

Learned and Professional Societies: Foundation Fellow, Indian Academy of Sciences and Indian Chemical Society; Foundation Member, Society of Soil Sciences (Foundation President) and Royal Institute of Chemistry (London).

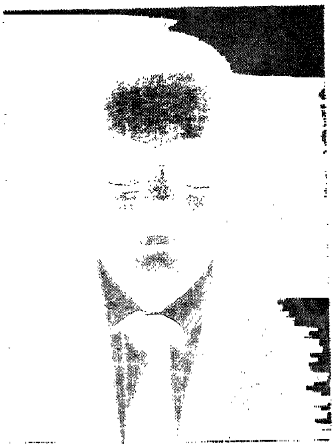
Awards and Honours: President, Agricultural Section, Indian Science Congress (1937); *Rao Bahadur* (1928); Coronation and King's Silver Jubilee Medal; CIE (1943); OBE.

Policy-making Bodies: Hony Adviser to the Planning Commission on Agricultural Programmes (1951-52). Chairman Soil, Science Committee of ICAR (1952-56).

Died 1 February 1964.

VISWAMITRA, Mysore Ananthamurthy

Elected 1983



Born 14 November 1932; Shimoga, Karnataka
Ph.D. (1960), Indian Institute of Science (IISc), Bangalore

Specialization: X-ray Crystallography, Physics, Molecular Biophysics

Research Achievements: Viswamitra is distinguished for his pioneering work on X-ray structural studies of DNA fragments from monomer to oligonucleotides. His work has led to the idea of sequence-dependent oligonucleotide conformation, a new concept after 25 years of DNA as a uniform helix. He has also carried out pioneering studies on the X-ray structures of nucleotide coenzyme molecules.

Positions: Professor of Physics, IISc, Bangalore; Visiting Professor, University of Cambridge.

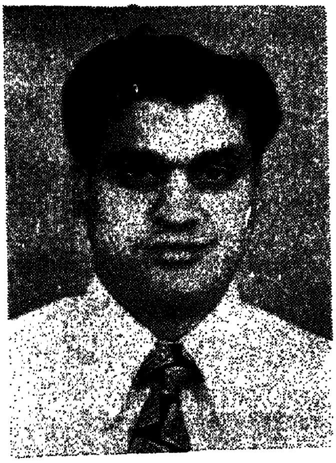
Learned and Professional Societies: Fellow, Indian Academy of Sciences and Third World Academy of Sciences; Member, INSA Council (1990-92).

Awards and Honours: Jagadish Chandra Bose Medal (INSA) (1986); Shanti Swarup Bhatnagar Medal (INSA) (1993); Third World Academy of Sciences-Biology Prize.

Address: Professor, Department of Physics, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2312), 341261; Res: 240 A, 15th Main, Raja Mahal Vilas Extension, Bangalore 560 080; Tel: (080) 341678.

VISWANADHAM, Nukala

Elected 1988



Born 9 November 1943; Anathavaram, Andhra Pradesh
Ph.D. (1970), Indian Institute of Science (IISc), Bangalore

Specialization: Manufacturing Systems and Technologies, Fault- tolerant Control Systems

Research Achievements: Viswanadham has developed Petrinet- based techniques for modelling and performance analysis of automated manufacturing systems, techniques for composite reliability-performance analysis of manufacturing systems, and techniques for reliable control of dynamical systems under sensor, actuator failures.

Positions: Tata Chem Professor (1992-), Professor, IISc, Bangalore.

Learned Societies: Fellow, Institute of Electrical and Electronics Engineers (USA), Indian Academy of Sciences, and Indian National Academy of Engineering.

Author/Editor Facet: Authored 'Reliability of Computer and Control Systems' (North Holland Systems and Control Series, 1987), 'Performance Modelling of Automated Manufacturing Systems' (Prentice-Hall, 1992) and edited/coedited 4 Books; editor, *Sadhana* (1992-); served associated editor, *IEEE Trans.: Automatic. Cont., Informat. Decis Technol.* (1985-); member editorial boards of: *Intel. Robot. Sys.* (1988-), *Contr. Theor. Adv. Technol.* (1985-), *Asia-Pacific Engng J.* (1991-) and of many other journals in information technology.

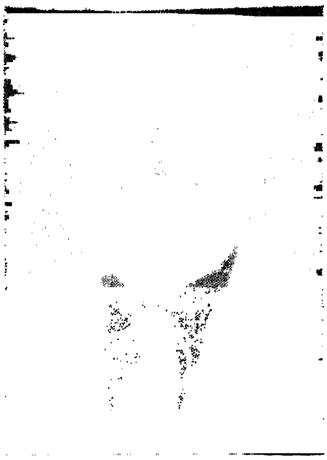
Policy-making Bodies: Served as member of working groups, etc. of Science Advisory Council to the the Prime Minister (1987-89), DOE (1991) and DST (1991).

Address: Professor, Department of Computer Science and Automation, Indian Institute of Science, Bangalore 560 012; Tel: (080) 344411 (Ext 2368/2369);

Fax:91-80-341683; E-mail: vishu@csa.iisc. emet.in; Res: 121A, Sharada Colony (KHBCS), Basaveswara Nagar, Bangalore 560 079; Tel: (080) 358992.

VISWANATHAN, Raman

Elected 1969



Born 8 September 1899; Nagarcoil, Tamil Nadu
M.D. (1931), University of Madras; M.R.C.P. (1930), University of London, UK

Specialization: Medical Science

Research Achievements: Viswanathan was the first to recognize tropical eosinophilia as a separate clinical entity in 1936. He described for the first time the pathology of tropical eosinophilia in 1944 on the basis of autopsy studies; and he reported positive leucocyte adhesion phenomenon with *M. bancrofti* in tropical eosinophilia.

Positions: Medical Specialist, Indian Army, II World War; Adviser in Tuberculosis, Government of India; Deputy Director-General, Health Services; Director and Head, Department of Medicine (Tuberculosis, and Chest Diseases) and Dean, Faculty of Medical Sciences, Patel Chest Institute, Delhi (1964-82).

Learned and Professional Societies: Fellow, American College of Chest Physicians and Academy of Medical Sciences; Member, Tuberculosis Association of India and Indian Association for Chest Diseases

Awards and Honours: Eugeno Morelli Prize (National Academy of Sciences, Italy), Forlanini Medal (Italian Tuberculosis Association); Dhanwantari Prize (INSA) (1971); Padma Bhushan.

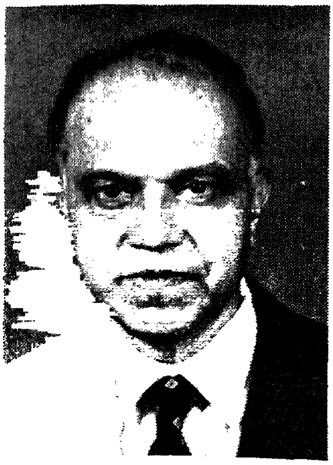
Author/Editor Facet: Contributed chapters to two books: 'Non- tuberculosis Diseases of Chest' and 'Dyspnoea' (both published by American College of Chest Physicians); authored three books 'Pulmonary Tuberculosis', 'Diseases of the Chest' and 'Post- Gradute Medical Education' (all by Asia Publishing House).

Died 14 July 1982.

VISWANATHIAH, Mysore Nanjappa

Elected 1982

Born 23 November 1921; Maindanahalli, Karnataka
Ph.D. (1959), University of London, UK



Specialization: Economic Geology, Minerology

Research Achievements: Viswanathiah investigated Kaladgi and Badami Groups with particular reference to sedimentation, stratigraphy and tectonics. He discovered for the first time the Precambrian fossils in the Kaladgis, Badamis and even in the oldest rocks, Sargurs of Karnataka. The palynofossils like Chytonozoans and Scolecodonts of Ordovician age reported from Badamis are of stratigraphic significance.

Positions: Professor and Head, Department of Geology, University of Mysore (1961-81); Vice-Chancellor, Bangalore University, Bangalore.

Learned and Professional Societies: Member, Mineralogical Society of India (Vice-President, 1980) and Indian Association of Sedimentologists (President, 1979-80).

Awards and Honours: Silver Jubilee Gold Medal (Kiev University) (1969); Mysore Geologists' Gold Medal (Geological Society of India) (1975); President, Geology and Geography Section, Indian Science Congress (1982-83).

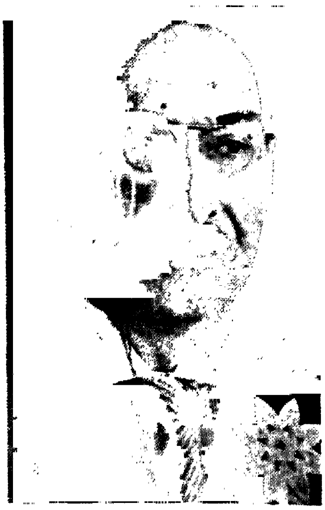
Author/Editor Facet: Edited *Indian Mineralogist.*

Policy-making Body: Member, International Geological Correlation Programme on three projects.

Died 24 January 1986.

WADIA, Darashaw Nosherwan

Foundation Fellow



Born 23 October 1883; Surat, Gujarat
M.Sc., University of Bombay; D.Sc. (*h.c.*)

Specialization: Geology

Research Achievements: Wadia devoted his lifetime to solve the complex problems of Himalayan geology. He also made seminal contribution to our knowledge of mineral wealth of the country, especially with respect to copper, mica, atomic minerals as uranium and heavy minerals as monazite.

Positions: Professor of Geology (1907-21), Prince of Wales College (now Mahatma Gandhi College), Jammu; Assistant Superintendent, Geological Survey of India; Government Minerologist (in Ceylon); Mineral Adviser, Government of India; First Director, Indian Bureau of Mines; Head, Raw Materials Division, Atomic Energy Commission.

Learned and Professional Societies: Fellow, Royal Society of London; Correspondent, Geological Society of America; Hony Member, German Geological Society, Belgian Geological Society, Geological Society of India (President, 1951-52), Mining, Geological and Metallurgical Institute of India (President, 1951- 52), Asiatic Society, Ceylon Branch, and Indian Institute of Metals; Commonwealth Member, Geological Society of London; President, Calcutta Geographical Society (1938), Engineering Geological Society of India (1965-66), and Geochemical Society of India (1965-67); President, INSA (1945-46).

Awards and Honours: President, Indian Science Congress (1942, 1943); Leopald Von Plakette Medal (German Geological Society); Meghnad Saha Medal (INSA) (1962); Khaitan Gold Medal (Asiatic Society) (1964); Sarbadhikari Gold Medal (University of Calcutta) (1964); First National Professor in Geology; Padma Bhushan (1962).

Author/Editor Facet: Wrote many books including 'Geology of India' (Macmillan 1919); and 'Structure of the Himalayas' (1938).

Policy-making Bodies: Served on several research committees of CSIR; Chairman, Central Board of Geophysics; (first) President, Institute of Himalayan Geology; and several other bodies.

The Institute of Himalayan Geology has been re-named after him in recognition of his contributions to geology.

Died 1969.

WADIA, Noshir Hormusji *Elected 1986*

Born 20 January 1925; Surat, Gujarat
M.D. (1950), University of Bombay

Specialization: Clinical Neurology

Research Achievements: Using both clinical and basic laboratory methods, Wadia has described, for the first time in the world, two new diseases -- enterovirus 70 disease, and autosomal dominant cerebral ataxia with slow saccades and peripheral neuropathy, in a variety of olivopontocerebral disorders, now called 'Wadia type'. Also pointed out greater prevalence and recognition of certain diseases like multiple sclerosis amongst Parsees and congenital atlanto-axial disorders and disseminated cysticercosis amongst Indians, pointing out their pathogenetic basis.

Positions: Professor of Neurology (Retired), Grant Medical College and Consultant Neurologist for Life, J.J. Group of Hospitals; Director of Neurology, Jaslok Hospital and Research Centre, Bombay.

Learned Societies: Fellow, Royal College of Physicians (London); Academy of Medical Sciences, and Indian Academy of Sciences; Corresponding Member, American Neurological Association, Association of British Neurologists, and Sociedad Neurologica, Argentina; Hony Member, Sociedad Chilena de Neurologica, Psiquiantria Neurocirgula, Chile; Hony Corresponding Member, Austrian Society of Tropical Medicine and Parasitology.

Lectureships: Chandi Oration (NSI); Sarabhai Oration (Association of Physicians of India); Laxmipathi Orations; Royal Air Force Prestige Oration.

Author/Editor Facet: Contributed chapters to 'Textbook of Medicine' (Oxford) and several other standard works like 'Handbook of Clinical Neurology'; editorial adviser, *J. Neurol. Sci., J. Trop. Geograp. Neurol.*, etc.

Policy-making Bodies: Member, Governing Council, Sree Chitra Tirunal Institute, Trivandrum; Founder Member, Research Group of Tropical Neurology of World Federation of Neurology, Vice- President, World Federation of Neurology.

Other Contributions: Wadia has carved out a niche for himself as a postgraduate teacher to several generations of students in general medicine and Neurology.

Address: Director of Neurology, Jaslok Hospital & Research Centre, 15, Dr. G. Deshmukh Marg, Bombay 400 026; Tel: (022) 4933333; Telex: 011-75743; Fax: 91-22-4948008; Res: A/8, Ben Nevis, 100, Bhulabhai Desai Road, Bombay 400 036; Tel: (022) 3674911-12 (Off): (022) 3649083 (Res).

WAHI, Prem Nath

Elected 1957

Born 10 April 1908; Moradabad, Uttar Pradesh
M.D. (1934), University of Lucknow, M.R.C.P. (1938), London, F.R.C.P., London, UK, D.Sc. (*h.c.*), Agra and Bundelkhand universities

Specialization: Pathology, Cancer, Medical Education

Research Achievements: Wahi's researches shed light on cancer of the oral cavity and its causal relationship with tobacco- chewing and smoking; and cancer of cervix uteri, and its relationship with marital status.

Positions: Professor of Pathology and Principal, S.N. Medical College, Agra; Vice-Chancellor, Agra University; Director- General, Indian Council of Medical Research.

Learned and Professional Societies: Fellow, National Academy of Sciences, International Academy of Cytologists, Royal College of Physicians (London), Royal College of Pathologists (London), and Indian Academy of Specialists; Member, Indian Association of Pathologists and Indian Medical Association; Associate Member, Association of Cancer Research Workers (USA); Hony Member, Brazilian Cancer Society; Member, INSA Council.

Awards and Honours: Hewett Gold Medal (University of Lucknow) (1932); Sandoz Cancer Research Award (ICMR) (1972); Padma Bhushan (1970).

Lectureships: Lady Brahmachari Oration Award (University of Calcutta) (1964); Sir Nilratan Sarkar Oration Award (University of Calcutta) (1964); International Cancer Cytology Oration (1971); Bishambar Nath Chopra Lecture (INSA) (1971).

Author/Editor Facet: Edited *Indian J. Med. Educ.*

Policy-making Bodies: Served as member of Medical Council of India, International Union against Cancer, WHO Global Research Advisory Committee, and several other bodies.

Died (Date N.A.)

WARE, Sir Frank

Foundation Fellow

Born 22 February 1886
M.R.C.V.S. (1907)

Specialization: Veterinary Science

Research Achievements: Ware made contributions to protozoology, helminthology and other branches of veterinary science. He also organised several veterinary service establishments in India.

Positions: Indian Veterinary Service: Principal, Madras Veterinary College; Director, Veterinary Services, Madras, and Imperial Veterinary Research Institute, Mukteswar; Animal Husbandry Commissioner, Imperial Council of Agricultural Research; Director, Animal Husbandry, United Provinces.

Learned and Professional Societies: Fellow, Royal College of Veterinary Surgeons.

Awards and Honours: CIE. (1937); Knighted (1946).

Died 6 December 1968.

WEST, William Dixon

Foundation Fellow

Born 27 January 1901; England
Sc.D. (1945), University of Cambridge, UK; D.Sc. (*h.c.*), Banaras Hindu University, Indian School of Mines, and University of Saugor

Specialization: Applied Geology

Research Achievements: West worked in three major areas: (i) the structure of the Archaean rocks in the Nagpur district, recognizing nappe structures; (ii) the structure of the Himalayan rocks in the Simla Hills, with the recognition of overthrusts;

and (iii) Deccan Trap volcanicity. He also studied Indian earthquakes, and the geology of part of Afghanistan north of the Hindu Kush.

Positions: Vice-Chancellor (1971-72), Emeritus Professor, Professor (1955-), Department of Applied Geology, University of Saugor, Sagar; Director (1945-47), Assistant Geologist (1923), Geological Survey of India.

Learned and Professional Societies: Foundation Fellow, Geological Society of India; Fellow, National Academy of Sciences (India); Member, Geological Society (London), Mineralogical Society of India, and Geological, Mining and Metallurgical Society of India; Member Council (1947-48, 1958-60, 1963-65), Secretary (1945), Vice- President, (1941- 44, 1946, 1949), INSA.

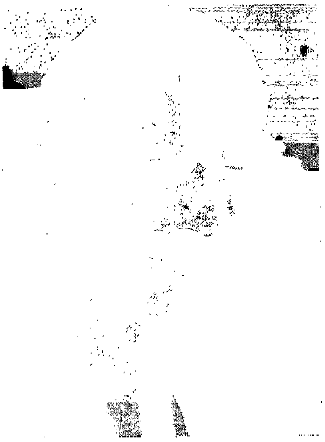
Awards and Honours: Star of Afghanistan (1942); CIE (1947); Lyell Medal (Geological Society, London) (1951); P.N. Bose Memorial Medal (Asiatic Society) (1959); President, Indian Science Congress (1971-72); D.N. Wadia Medal (INSA) (1983).

Other Contributions: West built up the Geology Department of University of Saugor into a centre of Advanced Study in Geology. He has rendered yeoman service to geological education in India. And Indian geology owes a great deal to William Dixon West.

Address: Emeritus Professor, Department of Applied Geology, University of Saugor, Sagar 470 003; Res: B5 Gour Nagar, Sagar, Madhya Pradesh.

WHEELER, Sir Robert Eric Mortimer

Elected 1945



Born 10 September 1890
D.Litt, University of London, UK, D.Litt (*h.c.*), University of Bristol, UK

Specialization: Archaeology

Research Achievements: Wheeler was an outstanding archaeologist who directed a series of excavations at Colchester (1917-20), Carharbon (1921-23), Brecas (1924-25), Caerlon (1926-27), Sydney (1928-29), St. Albans (1930-33), Maiden Castle, Dorset (1934- 37), Brittany (1938), Normandy (1939), India (1944-48) and Pakistan (1941-50).

Positions: British Archaeologist, Hony Director, Institute of Archaeology, University of London (1935-44); Director-General of Archaeology, India (1944-48); Archaeological Adviser to the Government of Pakistan (1948-50); Professor of Archaeology, Roman Provinces, University of London (1948-55).

Learned and Professional Societies: Member, Cambrian Archaeological Association (President, 1931), Southeastern Union of Scientific Societies (President, 1932), Museums Association (President, 1937-38), Indian Museum Association (President, 1947- 48), Pakistan Museum Association (President 1947), Royal Archaeological Institute (President, 1950), Society of Antiquaries (Vice-President, 1935-39, Secretary 1939 and Director, 1940-44; 1949-54, President, 1954), Fellow, British Academy (Secretary, 1949) and University College of London (1939- 43).

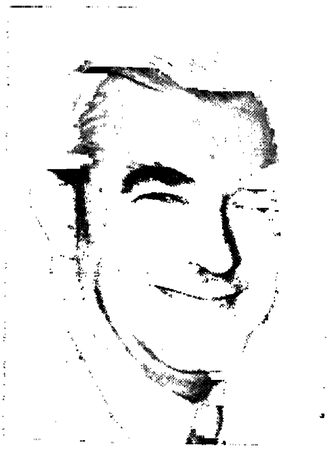
Awards and Honours: Gold Medal (Society of Antiquaries) (1944); Petric Medal (University of London) (1951); Lucy Wharton Drexel Medal (1952).

Author/Editor Facet: Wheeler was the author of several works in archaeology, which included 'Civilization of the Indus Valley and Beyond', 'The Indus Civilization; and Ancient Pakistan'.

Died 22 July 1976.

WHEELER, Thomas Sherlock

Foundation Fellow



Born 30 April 1899, Dublin, Ireland
Ph.D. (1924), D.Sc., University of London, UK

Specialization: Chemistry

Research Achievements: Wheeler had specialized in organic, synthetic and physical chemistry. His work consisted of theoretical calculations including theory of liquids, organic chemistry including synthetic and mechanistic work, applied work on the development of industrial processes, and analytical studies.

Positions: Senior Research Chemist, Winnigton (Cheshire), Research Laboratories, Imperial Chemical Industries; Principal and Professor, Organic Chemistry, Institute of Science, Bombay; Dean, Faculty of Science, University of Bombay; Consultant, Panjab and Patna universities; State Chemist, Ireland; Chairman, Department of Chemistry, University College, Dublin.

Learned and Professional Societies: Fellow, Indian Academy of Sciences (Vice-President), Institute of Physics, and Institute of Chemistry; Council Member, Indian

Chemical Society; and Member, Institute of Chemical Engineers (India); Vice-President, INSA.

Awards and Honours: President, Chemistry Section, Indian Science Congress (1939).

Other Contributions: Wheeler devoted much of his time to chemistry education both at school and at the university levels; he also did some historical work on Irish chemists.

Died 13 December 1962.

WRAIGHT, Ernest Alfred

Foundation Fellow

Born 5 March 1879
A.R.S.M.

Specialization: Mining and Metallurgy

Research Achievements: Wraight made some contributions to Indian mining and metallurgy.

Positions: Senior Demonstrator and Lecturer, Royal School of Mines (1903-14); Paymaster to R.E. Chatham and Supervising Pay- Master, R.D.C.; Lt in R.A.F. (1916-18) and Captain (1918- 20); Aeronautical Inspection Directorate; Metallurgical Inspector (1925-37); Collector of Excise (1934-37), Government of India.

Learned and Professional Societies: Fellow, Royal Institute of Chemistry; Member, Institute of Mines and Metals and Iron and Steel Institute.

Awards and Honours: Matthey Prize (Royal Society of Mines) (1903); Carnegie Scholarship (Iron and Steel Institute) (1904-6); CIE (1935).

Died 25 August 1946.

YADAVA, Jai Narain Singh

Elected 1985

Born 6 July 1930, Bulandshahar, Uttar Pradesh
Ph.D. (1966), Agra University

Specialization: Veterinary Microbiology, Immunology, Bacterial Genetics

Research Achievements: Yadava was the first Indian to report multiple drug resistance among *E. coli* strains. He has shown seriousness of drug resistance in intestinal bacteria of human and animal origin. By the use of typing techniques, he showed plasmid-controlled multiple drug resistance. The factor controlling virulence and pathogenicity in bacteria originating in animal intestines, he has shown, can be readily transferred to human enteropathogenic (or non-pathogenic) *E.coli* and *Salmonella typhimurium* by conjugation and phage-mediated transduction. Plasmids coding for drug resistance, metal resistance, serum resistance, colicin production, enterotoxin production, haemolysin production and synthesizing the adhering factors, he has shown, play a major role in the virulence and pathogenicity of bacteria. Plasmids responsible for colicin production could increase the virulence of the non-invasive strain which may even cause generalized infection. He has developed antidiarrhoeal agents from plant sources and synthetic compounds.

Positions: Emeritus Scientist, Scientist, Central Drug Research Institute, Lucknow.

Learned Societies: Fellow, National Academy of Agricultural Sciences (India).

Author/Editor Facet: Chief editor, *Indian Vet. Med. J.* (for over 16 years); editor, *Indian J. Anim. Res.* (1976-78).

Address: Emeritus Scientist, Central Drug Research Institute, Lucknow; 226 001; Tel: (0522) 232411, (Ext 4211); Telex: 0535-344; Fax: 91-0522-243405; Res: 52, New Hyderabad, Dr Deen Dayal Gupta Marg, Lucknow 226 001; Tel: (0522) 77683.

YAJNIK, Nirbhayashankar Amarji

Elected 1940

Born 28 November 1894; Ranavav, Pakistan
M.A., D.Sc.

Specialization: Chemistry

Research Achievements: Yajnik was an authority on colloidal chemistry. His research interests spanned: binary mixtures, adsorption, gels and sols, emulsions and soaps, magnetochemistry, photochemistry and radiochemistry.

Positions: Professor of Chemistry, Forman Christian College, Lahore; Reader, Department of Chemistry, Panjab University, Lahore.

Learned and Professional Societies: Associate, Royal Institute of Chemistry (London); Member, Indian Chemical Society.

Died 1963.

YASH PAL

Elected 1977

Born 26 November 1926; Jhang, Pakistan
Ph.D. (1958), Massachusetts Institute of Technology, USA
High-Energy Physics, Astrophysics, Communication, Science Policy and Space Technology

Research Achievements: Yash Pal has made significant contributions to the study of cosmic rays, high-energy physics, astrophysics, science education, communication and development. Specifically his work had led to: (i) first observation of negative meson, (ii) first observation of pair-production of elementary particles, (iii) elucidation of the properties of k- mesons and hyperons, (iv) first measure of K-K mass difference, (v) prediction of the rise in p-p cross-section, and (vi) recognition of the importance of excited states of particles in multiple meson production at high energies. He was the first to develop the leaky-box model of cosmic-ray propagation in the galaxy.

Positions: Chairman, University Grants Commission, New Delhi; Secretary, Department of Science and Technology (1984-86); Chief Consultant, Planning Commission (1983-84); Director, Space Applications Centre, Ahmedabad (1973-81); Professor, Tata Institute of Fundamental Research, Bombay.

Learned and Professional Societies: President, Indian Physics Association; Fellow, Indian Academy of Sciences, National Academy of Sciences (India), Gujarat

Science Academy, and Indian Astronomical Society; National Fellow, National Institute of Education; Member, INSA Council (1980-81).

Awards and Honours: Sixth Marconi International Fellowship Award (1980); G.P. Chatterjee Memorial Award (Indian Science Congress) (1987); Association of Space Explorers Award (1989); Padma Bhushan (1976).

Policy-making Bodies: Served as Member, UN Advisory Committee on Science and Technology for Development, Scientific Council, International Centre for Theoretical Physics, Trieste and Executive Committee, United Nations University; Vice President, IUPAP.

Other Contributions: As UGC Chairman, Yash Pal started many innovative programmes to improve the standards of education. A major programme is the serial 'Race to Save the Planet' in collaboration with USA and Australia. He has done extensive work in theory and practice of communication for development. Proposed ways of using modern technology, space technology in particular, in ways appropriate for developing countries.

Address: Chairman, Steering Committee, Inter - University Consortium for Educational Communication, Nuclear Science Centre, JNU Campus, P.O. Box 10502, New Delhi 110 067; Tel: (011) 6897421 (Off), 8929899 (Res).

ZAIDI, Sibte Hasan *Elected 1974*

Born 15 April 1918
Ph.D. (1954), University of London, UK

Specialization: Toxicology and Pathology

Research Achievements: Zaidi has specialized in the field of 'dust diseases' and their relationship to respiratory infections. His research helped for the first time, to find the cause of coal-miner's lung disease, silicosis and pneumoconiosis in coal-miners, particularly the relationship between pneumoconiosis and tuberculosis.

Positions: Director, Indian Institute for Experimental Medicine, Calcutta and Industrial Toxicology Research Centre, Lucknow; Adviser to the Ministry of Railways, Laboratory of Environmental and Occupational Safety and Health, M & C Directorate, Research Designs and Standards Organization, Lucknow; Deputy Director and Head, Department of Experimental Medicine, Central Drug Research Institute, Lucknow.

Learned and Professional Societies: Fellow, Royal College of Pathologists (London), National Academy of Medical Sciences (India), and National Academy of Sciences (India); President, Asian Society of Environmental and Industrial Toxicology.

Awards and Honours: Venezuelan Award of Honour (Sociadad Venezolana de Medicina Del Trabajo); Shanti Swarup Bhatnagar Prize (1963); Sir Ardeshirlal Dalal Memorial Gold Medal (1975); Yant Memorial Award, USA (1977); Physiology Society Gold Medal; Clinical Society Gold Medal; Padma Shri.

Author/Editor Facet: Authored 'Experimental Pneumoconiosis' and edited 'Environmental Pollution and Human Health' (CSIR).

Policy-making Bodies: Served as Vice-President, Expert Committee of International Register of Potentially Toxic Chemicals (UN); and as Member of Expert Committees of WHO, ILO and UNEP; also as consultant of these bodies.

Other Contributions: Zaidi has established in Sri Lanka an Environmental Toxicology Unit under ILO auspices and Laboratory of Industrial Toxicology and Occupational Health in Rangoon under WHO assistance.

Address: B-85, Nirala Nagar, Lucknow; Tel: (0522) 71371 (Off. & Res).

CHRONOLOGICAL INDEX

Foundation Fellows*

Agharkar SP
Ahmad N
Ajrekar SL
Anandarau K
Ash WC
Awati PR
Ayyangar GNR
Bagchee KD
Bahl KN
Baini Prashad
Banerji AC
Banerji SK
Beeson CFC
Berkeley-Hill OAR
Bhaskara Shastri TP
Bhatnagar SS
Bhattacharya DR
Bose DM
Bose GS
Bose JC
Bose SN
Brahmachari UN
Burridge W
Burt BC
Calder CC
Champion HG
Chaudhuri H
Chopra RN
Chowla S
Couchman HJ
Das K
Dastur RH
Dey BB
Dhar NR
Dunnicliff HB
Ekambaram T
Evans P
Fermor LL
Forster MO
Fowler GJ
Fox CS
Ganesh Prasad
Ghose SL
Ghosh JC
Ghosh PN
Glennie EA
Gravely FH
Guha BS
Haddow JR
Heron AM
Hora SL
Husain MA
Hutton JH
Iyengar MOP
Iyer LKA
Kapur SN
King CA
Knowles R
Koshy PK
Krishnan KS
Krishnan KV
Macmahon PS
Mahajani GS
Mahalanobis PC
Mathur KK
Matthai G
Mehra HR
Mehta KC
Metcalfe EP
Mitra SK
Mitter PC
Mohammed Wali
Mookerjee RN
Mowdawalla FN
Mukerji S
Mukherjee JN
Naik KG
Narayan AL
Normand CWB
Olver A
Paranjpye RP
Parija PK
Penman D
Philpot HP
Pinfold ES
Pruthi HS
Qureshi M
Raman CV
Ramanathan KR
Rao BR
Rao CRN
Rao CVH
Ray PC
Ray P
Row R
Roy SC
Royds T
Saha MN
Sahni B
Sen BM
Sen HK
Sen NR
Sen Gupta NN
Shaw FJF
Singh BK
Sinton, JA

---

*Professor S.R. Kashyap, one of the original nominees as Foundation Fellows (also nominated as one of the Vice- Presidents) died immediately before the Inauguration. The vacancy caused by death remained unfilled.

Sokhey SS
Spencer E
Sri Krishna
Stewart AD
Subramanyam V
Taylor J
Trimurti TS
Trevor CG
Venkataraman TS
Venkatesachar B
Vijayaraghavacharya T
Vijayaraghavan T
Vishwanath B
Wadia DN
Ware F
West WD
Wheeler TS
Wraight EA

1935

Bomford G
Bose SR
Burns W
Chakravarti SN
Chatterjee G
Chopra BN
Coulson AL
Datta S
Dunn JA
Dutt SB
Gee ER
Guha PC
Kichlu PK
Krishnan MS
Lal RB
Maheshwari P
Mata Prasad
Ramdas LA
Ray BB
Ray JN
Sarkar PB
Sen JM
Simpson RR
Srivastava PL
Sundararaj B
Ukil AC

1936

Abraham WEV
Ghosh J
Kothari DS
Law SC
Mills JF
Neogi P
Parkinson CE
Percival FG
Prasad BN
Seymour Sewell RB
Shortt HE

1937

Bharadwaja Y
Bhatia BL
Paranjpe GR
Rao HS
Rao KR
Siddiqi MR
Sircar AC
Soparkar MB
Sulaiman SM
Temple FC

1938

Aiyar R G
Auden JB
Bose NK
Chowdhury JK
Crookshank H
Datta SCA
Dhar SC
Hendry D
Joshi AC
Sur NK

1939

Banerjee K
Bharucha FR
Ghosh RN
Lewis CG
Mookerjee HK
Narlikar VV
Pandit CG
Pasricha CL
Rao L R
Sharif M
Venkataraman K

1940

Bagchi KN
Chowdhury KA
Ishaq Mohammed
Madhava KB
Majumdar DN
Narayanamurti D
Roy SC
Roy SK
Vishwa Nath
Yajnik NA

1941

Basu JK
Bhabha HJ
Bor NL
Dikshit BB
Ghosh PK
Ghurye GS
Guha BC
Majumdar RC
Mitra SC
Ram Behari
Savur SR
Shah RC
Singh BN
Sondhi VP

Bardhan JC
Bose RC
Chatterjee NC
De MN
Desai RD
Ghosh BN
Pichamuthu CS
Ramiah K
Seshadri TR
Sirkar SC
Sohoni VV
Tawde NR
Vachell ET

1943

Clegg ELC
Das AK
De P
Elwin V
Majumdar GP
Mukerji B
Raj Nath
Rakshit H
Randhawa MS
Ray RC
Setna SB
Sukhatme PV
Toshniwal GR
Tribedi BP

1944

Ahmad B
Basu NM
Bhaduri PN
Bose PK
Huque MA
Khan H
Khastgir SR
Kini MG
Mitra S
Mudaliar AR
Panja G
Rao BS
Roy SN
Uppal BN

1945

Banerji I
Ganguly PB
Ghosh S
Gill PS
Gupta JC
Joshi SS
Kundu BC
Mahadevan C
Mahanti PC
Nair US
Rao MVR
Roonwal ML
Wheeler REM

1946

Basu S
Basu UP
Coates JC
Ganapathi K
Kadam BS
Khanolkar VR
Kosambi DD
Malhotra DR
Mundkur BB
Narayana B
Pal BP
Panse VG
Sarkar PB
Srivastava BN
Verman Lal C

1947

Nehru Jawaharlal

1948

Bhimachar BS
Bose PC
Chatterjee SC
Dastur JF
Dutta AK
Dutta Roy RK
Heilig R
Krishnaswami KR
Macgregor RA
Mitter GC
Moghe MA
Raju SP
Ramanujam S
Rao SR
Ray JC

1949

Bhaduri JL
Bhagavantam S
Chakrabarty SK
Chakravarti D
Damodaran M
Das BK
Jacob K
Mahabale TS
Mitra HK
Mitra K
Pandya AH
Parthasarathy N
Racine C
Sen KC
Varma RS

1950

Antia DP
Auluck FC
Bhatnagar PL
Biswas K
Bose JP
Chaudhuri RN
Ghatage VM
Gupta H
Job TJ
Krishnan RS
Nath MC
Ray HN
Sahni MR
Sreenivasan A
Vasudeva RS

1951

Asundi RK
Basu KP
Chattopadhyaya K
Das Gupta CR
Ghosh S
Greval SDS
Gupta S
Iyer PVK
Khosla AN
Lal KB
Rao SRN
Sawhney K
Sen NK
Shri Ranjan

1952

Banerjee S
Dessau G
Mehra PN
Panikkar NK

Parthasarathy S
Pramanick SK
Raychaudhuri SP
Saksena RK
Sen B
Shah SM
Singh I
Thapar GS
Uppal HL

1953

Antia KF
Atma Ram
Buchi EC
Chhibber HL
Govindaswamy MV
Madhavarao BS
Mitra RP
Mukherjee KC
Palit SR
Raizada MB
Santapau H
Seshachar BR
Thacker MS
Vaidya WM

1954

Basu BC
Bhattachary SK
Chandrasekharan K
Dixit KR
Ghosh S
Jhingran AG
Kilpady S
Kothavala ZR
Kumar LSS
Modak NV
Rao CR
Roy AK
Sen RN
Sen Gupta M
Sircar SM

1955

Bambah RP
Bhatia ML
Bose NK
Chakravarti DN
Chatterjee SD
Finch GI
Ganju PN
Ghosh CS
Ghosh TN
Misra R
Nagappa Y
Ramamurti B
Sadasivan TS
Seal SC
Venkiteshwaran SP

1956

Basu JN
Bhar JN
Bhattacharya P
Cadambe V
Chakravarti RN
Giri KV
Gulatee BL
Johri BM
Malurkar SL
Metre WB
Pal RK
Raychaudhuri SP
Satya Swaroop
Singh J
Thirumalachar MJ

1957

Bose A
Deb S
Doss KSG
Esh GC
Huzurbazar VS
Janaki Ammal EK
Mehta SM
Nair KR
Nijhawan BR
Puri V
Ramaswami LS
Rao TR
Roy BC
Shah NK
Wahi PN

1958

Ali SMA
Balbhadra Prasad
Banerjee T
Bhat JV
Das Gupta NN
Das Gupta SN
Lahiri DB
Mangalik VS
Mehra SR
Minakshisundaram S
Narayanan ES
Patwardhan VN
Peters B
Ray M
Subramaniam AP

1959

Bahadur RR
Bhowmik BB
Deshpande DL
Govindachari TR
Mukherji SM
Nagendra Nath NS
Nanjundayya C
Pande SK
Ramanathan KG
Saha AK
Sarkar SS
Sikka SM
Vakil RJ

1960

Ali SM
Chatterjea JB
Chatterjee B
Dhar ML
Ghosh AMN
Gupta SN
Lahiri A
Mishra RS
Sinha MS
Srivastava HD
Subramanian CV

Swaminathan M
Tiruvenkatachar VR

1961

Ananthakrishnan RI
Banerjee DK
Chatterjee A
Dey AK
Ganapati PN
Kundu DN
Mitra AP
Mitra SN
Rangaswami S
Ray SN
Seshaiya RV
Seth BR
Trivedi H
Venkateswarlu J

1962

Basu S
Dutt AB
Ghosh N
Govinda Rao NS
Joshi AB
Lal MB
Ray AP
Sarma PS
Sen PK
Sen Gupta JC
Sharma GP
Singwi KS
Tilak BD

1963

Anand BK
Chatterjee GP
Dutta NK
Gupta J
Mathur KS
Naidu PRJ
Ramachandran GN
Rao NVS
Sarabhai VA
Shrikhande SS
Singh SN
Swaminathan MS
Verma AR

1964

Kasliwal RM
Mehrotra RC
Nagchudhuri BD
Rajagopal CT
Tandon RN

1966

Bhattacharyya SC
Deshpande BG
Desikachary TV
Gayen AK
Gopalan C
Jai Krishna
Kothari LS
Mitra AN
Pradhan S
Rao CV
Raychaudhuri SP
Row LR
Roy BB
Sadhu DP
Sinha AKP

1967

Anantakrishnan SV
Dayal B
Menon PK
Paul RC
Singh B

1968

Bappu MKV
Bhide VG
Chakravarti R
Ganguly J
Ghosh SN
Gopal Ayengar AR
Joglekar DV
Mukerjee SM
Rao PS
Roy RP
Saha AK
Singh BN
Sukh Dev

1969

Brahm Prakash
Datey KK
Kapur JN
Kar AB
Krishnan PS
Kulkarni AB
Rao BR
Shankar J
Thind KS
Viswanathan R

1970

Menon MGK
Misra RC
Nitya Anand
Prasad MRN
Ramaiah NA
Sethna HN
Sharma AK
Surange KR
Venkateswarlu P

1971

Biswas SN
Dutta PC
Krishnamurti CR
Mookerjee S
Narasimham NA
Narasimhan MS
Ramalingaswami V
Santappa M
Suxena MR
Udupa HVK

1972

Ahmad F
Anantharaman TR
Baliah V
Chowdhury AB
Ganguli HC
Lal D.
Narasimhan PT

Nayar KK
Paintal AS
Pant DD
Pant NC
Ramaseshan S
Ramaswamy GS
Roy S
Saksena SB

1973

Bachhawat BK
Bhaskaran K
Bhattacharya SK
Chatterjea JN
Dhar MM
Hariharan P
Jagannathan V
Nanda KK
Radhakrishna BP
Ramanna R
Sarkar JK
Saxena KN
Seshadri CS
Sudarshan ECG
Vig OP

1974

Das Gupta MK
Deo MG
Jain HK
Joshi SK
Koteswaram P
Kushwaha RS
Mathur HB
Murty BR
Ramachandra K
Ramachandran A
Rao CNR
Sarkar SN
Sundararaj BI
Talwar GP
Zaidi SH

1975

Chinoy JJ
Daniel RR
George MV
Govind Swarup
Harish Chandra
Kanungo MS
Kanwar JS
Nair NB
Narasimhan R
Nayudamma Y
Raghunathan MS
Rastogi RP
Singh V.
Sundaram K
Tandon SL

1976

Aswathanarayana U
Bhargava KS
Bhattacharyya PK
Iyengar PK
Joshi BS
Manna GK
Notani NK
Pande IC
Parthasarathy KR
Sanyal GS
Sastri MVC
Sharma MM
Sreekantan BV
Sriramachari S
Trehan SK

1977

Ananthakrishnan TN
Asana RD
Burma DP
Deodikar GB
Doraiswamy LK
Ghosh TK
Jain GC
Jain MK
Kailasam LN
Kessar SV
Khoshoo TN
Luthra UK
Mani Anna
Mukherjee SK
Nagarajan K
Naha K
Narlikar JV
Nigam HL
Puri BR
Qasim SZ
Ramachandran LKI
Ramanan S
Ranadive KJ
Sharma A
Siddiqi O
Srivastava PN
Thosar BV
Vaidyanath LR
Venkataraman G
Yash Pal

1978

Agarwala SC
Bhimasankaram VLS
Biswas AB
Biswas BB
Chandrasekhar S
Chidambaram R
Chopra KL
Choudhury B
Dhawan S
Ghosh A
Jain PC
Khush GS
Maheshwari SC
Mohan Ram HY
Nag B
Nasipuri D
Patel CC
Pisharoty PR
Prem Narain
Radhakrishnan AN
Raghavan S
Rajasekarasetty MR
Ramadas VS
Sharma KN
Sinha APB
Sodha MS
Subbarao EC
Sukheswala RN

Swaminathan S
Thapliyal JP

1979

Barnabas J
Bhakuni DS
Bhargava PM
Bhattacharyya A
Chakravorty A
Dass CMS
Dhawan BN
Dinesh Mohan
Gangulee HC
Ganguly AK
Ghosh SK
Har Swarup
Jain SC
Jha SS
Kallianpur G
Kasturi TR
Khan AM
Lakhanpal RN
Moudgal RN
Narasimha R
Ramakrishnan T
Rao NGP
Rao UR
Sastri VV
Sen SK
Sengupta P
Sinha KP
Srivastava US
Sundaram CV
Tandon PN

1980

Agarwala UC
Basu D
Bhargava KP
Biswas S
Bose MK
Chowdhury M
Datta Munshi JS
Ganguli NC
Garde RJ
Gaur VK
Ghatak UR
Gopinath N
Gupta AS
Gupta BM
Guraya SS
Kedharnath S
Maitra PK
Mukunda N
Pai MA
Ramakrishnan PS
Ramaniah MV
Ramarao P
Sasisekharan V
Sen HG
Shah JJ
Singh RP
Sridharan R
Subramanyam K
Valdiya KS
Vijayaraghavan R

1981

Arya AS
Bhattacharyya JC
Bhutani OP
Bir SS
Buti B
Das J
Das PK
Gill KS
Hari Narain
Jacob TM
Jain AC
Jain DVS
Khan MMT
Khetrapal CL
Laumas KR
Mitra SK
Mookherjee A
Nagabushanam R
Pandeya SC
Rajagopal ES
Ramamurthi B
Randhawa NS
Ranganathan S
Ranganathan S
Rao VSR
Satyamurthy NS
Sen AB
Trivedi BS
Varadachari VVR
Venkataraman GS

1982

Abraham KP
Bhatia IS
Bilgrami KS
Bose AK
Bose MN
Chopra VL
Datta AG
Ghildyal BP
Ghosh JK
Ishwar Prakash
Jain SK
Krishna P
Majumdar CK
Mehrotra KN
Merh SS
Prasad G
Rajaraman V
Ramanathan N
Rangarajan SK
Rastogi RG
Rudraiah N
Sandhu SS
Sastry PS
Sathyanesan AG
Sengupta SM
Vaidyanathan CS
Viswanathiah MN

1983

Bhatia SB
Chadha MS
Chakravorty D
Dastur DK
Divatia AS
Dumir VC
Dutta Roy SC
Govil G
Husain A

Jussawalla DJ
Kapil RN
Katiyar SS
Khatri CG
Mathews PM
Mehta G
Mukherjee AS
Ramanujam S
Rao PVS
Rao SRV
Saha AK
Satya Prakash
Sen SP
Sharma VP
Siddiquie HN
Singh D
Sinha SK
Somayajulu BLK
Subbarao NS
Varadarajan S
Vishwamitra MA

1984

Adiga PR
Agarwal SC
Ahluwalia JC
Arunachalam VSR
Awasthi DD
Bhatt MV
Chopra SRK
Dominic CJ
Dutta GP
Gadgil MD
Kapoor SS
Kaw PK
Krishan Lal
Mashelkar RA
Modi VV
Pakrashi SC
Prakasa Rao BLS
Prihar SS
Ramakrishnan TV
Rao N. Appaji
Reddy GKN
Rohatagi-Mukherjee KK
Roy A
Sarma YSRK
Shastry SVS
Singh JS
Sohi HS
Thomas J
Udgaonkar BM
Valiathan MS

1985

Agarwal GS
Balaram P
Das BN
Dasannacharya BA
Deekshatulu BL
Dogra PD
Gnanam A
Indira Gandhi
Gopala Rao RV
Kapil RS
Kumar R
Malik CP
Manoharan PT
Mukherjee SK
Padmanabhan G
Parthasarathy R
Rajappa S
Rajaraman R
Ram Udar
Ramanamurthy PV
Ramachandra Rao P
Reddy CRRM
Reddy GM
Shah VC
Srinivasan MS
Krishna Swarup
Tandon HD
Varma RK
Tata JRD
Yadava JNS

Abrol IP
Abrol YP
Bhaduri AN
Bhattacharyya AB
Chandra HGS
Chatterjee SN
Cowsik R
Datta Majumdar DK
De R
Gopalan K
Gupta PK
Jhingran VG
Krishnan R
Krishnan V
Malhotra PK
Murty YS
Naqvi SM
Pandya SP
Paroda RS
Pillai MKK
Rajasekaran G
Rama Rao AV
Rao KJ
Ray NK
Sen S
Shorey TN
Singh MP
Sivaraman C
Srinivasan R
Wadia NH

Abhyankar SS
Arunachalam V
Chaturvedi UC
Deb BM
Gill BS
Guptasarma D
Kannan KK
Kesavan PC
Lele S
Narendra Kumar
Maitra AP
Menon KKG
Mitra SK
Mukerjee SK
Mukhopadhyay D
Munjal ML
Nakra BC
Narasimhan NS
Padayatty JD

Pandian TJ
Prasad P
Ramamurthy VS
Ratnasamy P
Raychaudhuri AK
Saxena PN
Shah RV
Srivastava CM
Subba Rao GSR
Varma A
Vijayan M

1988

Agrawal BK
Balasubramanian D
Balasubramanian R
Banerji PK
Bhatia C
Chakravarti RN
Chandrashekaran MK
Chitre SM
Das J
Datta A
Khattri KN
Krishna Rao GS
Kumar HD
Meher-Homji VM
Mittal JP
Mohanty PK
Nanda J
Nayak NC
Natarajan P
Nori MV
Rama
Ramamurthi R
Rao AK
Sanyal SC
Sharma T
Sikka SK
Singh NT
Singh S
Vaidya PC
Viswanadham N

1989

Abhyankar KD
Bhisey AN
Biswas NN
Chattoraj DK
Easwaran KRK
Gupta CM
Gupta HK
Jacob KT
Kamboj VP
Kasturirangan K
Krishnaswami S
Kumar A.
Muthukkaruppan VR
Passi IBS
Pradhan SK
Ramasarma T
Ramachandran B
Rangaswamy NS
Rao KR
Reddy CA
Roy SM
Sachar RC
Sen SK
Sinha BC
Singhi NKM
Takkar PN
Tandon BN
Thathachar MAL
Venkatesan K
Venkoba Rao A

1990

Bamji MS
Banerjee H
Bhattacharyya S
Bhawalkar DD
Dani SG
Gangal SG
Junjappa H
Kenkare UW
Krishnamurthy SS
Mathan VI
Mathur A
Mishra SK
Nag K
Pal MK
Parimala R
Rajendra P
Prasad YVRK
Raghavarao R
Ramamurti V
Rao AR
Roy AB
Sachdev PL
Sarma VVS
Sekhon GS
Sethunathan N
Singh PK
Subramanian S
Surolia A
Tewari HB
Verma JP

1991

Banerjee K
Chaudhuri MK
Das HK
Gupta AK
Kochupillai N
Kulkarni BD
Mukherjee D
Nadkarni MG
Sane PV
Saxena RN
Singh RN
Singh SJ

1992

Banerjee S
Bhaskaran G
Chandrasekaran S
Das MR
Das Gupta S
Gopinathan MS
Gupta LC
Hasan M
Jairajpuri MS
Lakshmanan M
Nath I
Patnaik LM
Ramakrishnan C Rao MRS
Reddy BM
Roy P

Sahni A
Sharma RS
Singh B
Singh R
Sinha VRP
Sridharan A
Subba Rao GV
Subrahmanyam NC
Venkatesh YV

1993

Ambasht RS
Appa Rao KMV
Balasubramanian KK
Bhaduri S
Chakravorty M
Chawla MM
Gadagkar R
Ganguly C
Ganguly NK
Gopinathan KP
Hans Gill RJ
Jayaraman R
Johri MM
Lakhotia SC
Mahajan KK
Malik SK
Malhotra KC
Mukherjee P
Narlikar AV
Nityanand S
Paul DK
Purkayastha RP
Reddy VU
Roy DP
Sathyamurthy N
Shanmugam G
Sheth AR
Virk DS

SUBJECT-WISE LIST

Sectional Committee -I

Mathematical Sciences

Applied Mathematics, Pure Mathematics and Statistics

Abhyankar SS
Anandarau K
Bahadur RR
Balasubramanian R
Bambah RP
Banerji AC
Bhatnagar PL
Bhutani OP
Bose RC
Chakrabarty SK
Chandrasekharan K
Chawla MM
Chowla S
Dani SG
Das Gupta S
Dhar SC
Dumir VC
Ganesh Prasad
Gayen AK
Ghosh J
Ghosh JK
Ghosh NL
Ghosh S
Gupta AS
Gupta H
Hans-Gill RJ
Harish Chandra
Huzurbazar VS
Iyer PVK
Jain MK
Jain PC
Kallianpur G
Kapur JN
Khatri CG
Kosambi DD
Kushwaha RS
Lahiri DB
Madhava KB
Mahajani GS
Mahalanobis PC
Maitra AP
Malik SK
Menon PK
Minakshisundaram S
Mishra RS
Mitra SK
Mukunda N
Nadkarni MG
Nagendra Nath NS
Nair KR
Nair US
Narasimhan MS
Narlikar VV
Nori MV
Paranjpye RP
Parimala R
Parthasarathy KR
Parthasarathy R
Passi IBS
Prakasa Rao BLS
Prasad BN
Prasad G
Prasad P
Racine C
Raghavan S
Raghunathan MS
Rajagopal CT
Ram Behari
Ramachandra K
Ramachandran B
Ramamurti B
Ramanan S
Ramanathan KG
Rao CRR
Rao CVH
Ray M
Roy SN
Rudraiah N
Sachdev PL
Satya Swaroop
Sen B
Sen BM
Sen NR
Sen RN
Seshadri CS
Seth BR
Shah SM
Shorey TN
Shrikhande SS
Siddiqi MR
Singh B
Singh MP
Singh SJ
Singhi NKM
Sridharan R
Srivastava PL
Thiruvenkatachar VR
Trehan SK
Vaidya PC
Varma RS
Vijayaraghavan T

Sectional Committee-II

Physics

Astronomy and Astrophysics, Physics of Materials, Space Physics, Sub-atomic, Atomic & Molecular Physics and Theoretical Physics

Abhyankar KD
Agarwal GS
Agrawal BK
Appa Rao KMV
Asundi RK
Auluck FC
Banerjee H
Banerjee K
Bappu MKV
Basu D
Bhabha HJ
Bhagavantam S
Bhar JN
Bhaskara Shastri TP
Bhaskaran G
Bhattacharyya JC
Bhawalkar DD
Bhide VG
Biswas S
Biswas SN
Bose A
Bose DM
Bose JC
Bose SN
Buti B
Cadambe V
Chandrasekhar S
Chatterjee SD
Chidambaram R
Chitre SM
Chopra KL
Cowsik R
Daniel RR
Das Gupta MK
Dasanacharya BA
Datta S
Dayal B
Dhawan S
Divatia AS
Dixit KR
Dutta AK
Ganguly AK
Ghosh PN
Ghosh RN
Ghosh SN
Gill PS
Gupta LC
Gupta S
Gupta SN
Hariharan P
Ishaq M
Iyengar PK
Jain SC
Jha SS
Joshi SK
Kapoor SS
Kaw PK
Khastgir SR
Kichlu PK
Kothari DS
Kothari LS
Krishan Lal
Krishna P
Krishnan KS
Krishnan RS
Kumar N
Kundu DN
Lakshmanan M
Lal D
Madhavarao BS
Mahanti PC
Majumdar CK
Majumdar RC
Malhotra PK
Malurkar SL
Mathews PM
Menon MGK
Metcalfe EP
Mitra AN
Mitra AP
Mitra SK
Mohammed Wali
Mukerji S
Mukherjee P
Nag B
Nagchaudhuri BD
Nanjundayya G
Narasimham NA
Narayan AL
Narlikar AV
Narlikar JV
Pal MK
Pandya SP
Paranjpe GR
Parthasarathy S
Peters B
Prakash S
Rajagopal ES
Rajaraman R
Rajasekaran G
Ramakrishnan TV
Ramamurthy VS
Ramanamurthy PV
Ramanna R
Ramaseshan S
Rao BR
Rao KR
Rao KR
Rao SR
Rao UR
Ray BB
Raychaudhuri AK
Roy DP
Roy P
Roy SM
Royds T
Saha AK
Saha MN
Saha NK
Sarabhai VA

Satyamurthy NS
Savur SR
Sikka SK
Singh RP
Singh V
Singwi KS
Sinha BC
Sinha KP
Sinha MS
Sirkar SC
Sodha MS
Sreekantan BV
Srivastava BN
Srivastava CM
Sudarshan ECG
Sulaiman SM
Swarup G
Tawde NR
Thosar BV
Udgaonkar BM
Vaidya WM
Varma RK
Venkataraman G
Venkatesachar B
Venkateswarlu P
Verma AR
Vijayaraghavan R
Viswamitra MA
Yash Pal

Sectional Committee -III

Chemical Sciences

Analytical, Organic, Inorganic , Physical and Theoretical Chemistry

Agarwala UC
Ahluwalia JC
Ahmad Bashir
Anantakrishnan SV
Bagchi KN
Balasubramanian KK
Balbhadra P
Baliah V
Banerjee DK
Bardhan JC
Basu S
Basu UP
Bhaduri S
Bhakuni DS
Bhatnagar SS
Bhatt MV
Bhattacharyya SC
Bhattacharyya SK
Biswas AB
Bose AK
Bose PK
Chadha MS
Chakravarti D
Chakravarti RN
Chakravarti SN
Chakravorty A
Chandrasekaran S
Chatterjea JN
Chatterjee Asima
Chattoraj DK
Chaudhuri MK
Chowdhury JK
Chowdhury M
Damodaran M
Deb BM
Desai RD
Dey BB
Dhar ML
Dhar MM
Dhar NR
Doss KSG
Dunnicliff HB
Dutt SB
Dutta PC
Dutta Roy RK
Finch GI
Fowler GJ
Ganguly PB
George MV
Ghatak UR
Ghosh BN
Ghosh JC
Ghosh S
Ghosh Sudhamoy
Ghosh TN
Gopala Rao RV
Gopinathan MS
Govil Girjesh
Govindachari TR
Guha BC
Guha PC
Gupta J
Hendry D
Jain AC
Jain DVS
Joshi BS
Joshi SS
Junjappa H
Kapil RS
Kasturi TR
Katiyar SS
Kessar SV
Khan MMT
Khetrapal CL
Krishna Rao GS
Krishnamurthy SS
Krishnan V
Kulkarni AB
Macmahon PS
Malhotra DR
Manoharan PT
Mata Prasad
Mehrotra RC
Mehta G
Mehta SM
Mitra RP
Mitra SK
Mittal JP
Mitter PC
Modak NV

Mukherjee D
Mukherjee JN
Mukherji SM
Nag K
Nagarajan K
Naik KG
Narasimha R
Narasimhan NS
Narasimhan PT
Nasipuri D
Natarajan P
Nayudamma Y
Neogi P
Nigam HL
Nitya Anand
Pakrashi SC
Palit SR
Patel CC
Paul RC
Pradhan SK
Puri BR
Qureshi M
Rajappa S
Rama Rao AV
Ramachandran A
Ramaiah NA
Raman CV
Ramaniah MV
Ranganathan S
Rangarajan SK
Rangaswami S
Rao B Sanjiva
Rao CNR
Rao KJ
Rao NVS
Rao PS
Rastogi RG
Rastogi RP
Ray JN
Ray NK
Ray P
Ray PC
Ray RC
Reddy GKN
Rohatgi-Mukherjee KK
Row L R
Sandhu SS
Santappa M
Sarkar PB (1935)
Sarkar PB (1946)
Sastri MVC
Sathyamurthy N
Sen HK
Sen NK
Sengupta P
Seshadri TR
Shankar J
Singh BK
Singh S
Sinha APB
Sircar AC
Spencer E
Sri Krishna
Subba Rao GSR
Subba Rao GV
Subramanian S
Sukh Dev
Swaminathan S
Tilak BD
Venkatesan K
Vig OP
Wheeler TS
Yajnik NA

Sectional Committee -IV

Engineering & Technology

Applied Physics, Chemical Technology, Electronics & Telecommunication, Engineering and Engineering Sciences

Abraham KP
Ahmed Nazir
Anantharaman TR
Antia DP
Antia KF
Arya AS
Ash WC
Atma Ram
Banerjee S
Basu JN
Bhattacharya SK
Bhattacharyya A
Bhattacharyya AB
Bhowmik BB
Biswas NN
Bose NK
Bose PC
Brahm Prakash
Chakravarti R
Chakravorty D
Chatterjee B
Chatterjee GP
Das BN
Das Jajneshwar
Datta Majumdar DK
Deekshatulu BL
Deshpande DL
Dinesh Mohan
Doraiswamy LK
Dutta Roy SC
Forster MO
Ganguly C
Garde RJ
Ghatage VM
Ghosh CS
Govinda Rao NS
Jacob KT
Jai Krishna
Jain GC
Joglekar DV
Kasturirangan K
Khosla AN

King CA
Krishnan R
Krishnaswami KR
Kulkarni BD
Kumar R
Lele S
Macgregor RA
Mashelkar RA
Mathur HB
Mehra SR
Mitra HK
Mitra SN
Mitter GC
Mookerjee RN
Mowdawalla FN
Munjal ML
Nakra BC
Nanda J
Narasimhan R
Nijhawan BR
Pai MA

Pandya AH
Patnaik LM
Philpot HP
Prasad YVRK
Rajaraman V
Raju SP
Rakshit H
Ramamurti V
Ramaswamy GS
Ranganathan S
Rao AK
Rao C V
Rao PR
Rao PVS
Ratnasamy P
Reddy VU
Sanyal GS
Sarma VVS
Sen Gupta M
Sethna HN
Shah RC

Sharma MM
Simpson RR
Singh DV
Sridharan A
Subbarao EC
Sundaram CV
Temple FC
Thacker MS
Thathachar MAL
Toshniwal GR
Trivedi H
Udupa HV
Uppal HL
Vaidyanath LR
Venkataraman K
Venkatesh YV
Venkiteshwaran S
Verman LC
Viswanadham N
Wraight EA

Sectional Committee - V

Earth Sciences

Atmospheric Sciences, Geography, Geo-Sciences and Oceanogra

Abraham WEV
Ahmad F
Ali S Muzafer
Ananthakrishnan R I
Aswathanarayana U
Auden JB
Banerji PK
Banerji SK
Basu S
Bhatia SB
Bhimasankaram VLS
Bomford G
Bose MK
Bose NK
Chatterjee G
Chatterjee SC
Chhibber HL
Clegg ELG
Coates J

Couchman HJ
Coulson AL
Crookshank H
Das AK
Das PK
Deb SS
Deshpande BG
Dessau Gabor
Dey AK
Dunn JA
Dutt AB
Evans P
Fermor LL
Fox CS
Ganju PN
Gaur VK
Gee ER
Ghosh AMN
Ghosh PK

Ghosh SK
Glennie EA
Gopalan K
Gulatee BL
Gupta AK
Gupta HK
Guptasarma D
Hari Narain
Heron AM
Jacob K
Jhingran AG
Kailasam LN
Khattri KN
Kilpady S
Koteswaram P
Krishnan MS
Krishnaswami S
Lahiri A
Lewis CG

Mahadevan C
Mahajan KK
Mani Anna
Mathur KK
Merh SS
Metre WB
Mishra SK
Misra RC
Mookherjee A
Mukhopadhyay D
Nagappa Y
Naha K
Naidu PRJ
Naqvi SM
Normand Charles WB
Pande IC
Paul DK
Penman D
Percival FG
Pichamuthu CS
Pinfold ES
Pisharoty PR
Pramanick SK
Qasim SZ
Radhakrishna BP
Raghavarao R
Raj Nath
Rama
Ramanathan KR
Ramdas LA
Rao BR
Rao LR
Rao SRN
Reddy BM
Reddy CA
Roy A
Roy AB
Roy AK
Roy BC
Roy S
Roy SC
Roy SK
Saha AK
Sahni A
Sahni MR
Sarkar SN
Sastri VV
Sen S
Sen SK
Sengupta SM
Sharma RS
Siddiquie HN
Singh RN
Sohoni VV
Somayajulu BLK
Sondhi VP
Srinivasan MS
Subramaniam AP
Sukheswala RN
Sur NK
Vachell ET
Valdiya KS
Varadachari VVR
Viswanathiah MN
Wadia DN
West WD
Wheeler REM

Sectional Committee -VI

Plant Sciences

Structural, Developmental, Functional, Genetical, Ecological, Taxonomical and Evolutionary Aspects

Abrol YP
Agarwala SC
Agharkar SP
Ajrekar SL
Ambasht RS
Asana RD
Awasthi DD
Banerji I

Bharadwaja Y
Bhargava KS
Bharucha FR
Bilgrami KS
Bir SS
Biswas K
Bose MN
Bose SR
Calder CC
Chaudhuri H
Chinoy JJ
Chopra VL
Das Gupta SN
Dastur JF
Dastur RH
Desikachary TV
Ekambaram T
Gangulee HG
Ghose SL
Gnanam A
Gopal-Ayengar AR
Gupta PK
Iyengar MOP
Jain SK
Janaki Ammal EK
Johri BM
Johri MM
Joshi AC
Kapil RN
Kesavan PC
Khoshoo TN
Kumar HD
Kundu BC
Lakhanpal RN
Mahabale TS
Maheshwari P

Maheshwari S C
Majumdar GP
Malik CP
Meher-Homji VM
Mehra PN
Mehta KC
Misra R
Mohan Ram HY
Mohanty PK
Murty YS
Nanda KK
Pande SK
Pandeya SC
Pant DD
Parija PK
Puri V
Purkayastha RP
Raizada MB
Ram Udar
Ramadas VS

Ramakrishnan PS
Rangaswamy NS
Roy RP
Sachar RC
Sadasivan TS
Sahni B
Saksena RK
Saksena SB
Sane PV
Santapau H
Sarma YSRK
Sen SK
Sen SP
Sen Gupta JC
Shah JJ
Sharma A
Sharma AK
Shaw FJF
Shri Ranjan
Sikka SM

Singh BN
Singh JS
Singh PK
Sinha SK
Sircar SM
Sohi HS
Subrahmanyam NC
Subramanian CV
Subramanyam K
Surange KR
Suxena MR
Tandon RN
Tandon SL
Thind K S
Thirumalachar MJ
Trivedi BS
Varma A
Venkataraman GS
Venkateswarlu J

Sectional Committee

Animal Sciences

Structural, Developmental, Functional, Genetical, Ecological, Behavioural, Taxonomical and Evolutionary Aspects

Aiyar RG
Ali SMA
Ananthakrishnan TN
Awati PR
Bahl KN
Baini Prashad
Bhaduri JL
Bhatia BL
Bhatia ML
Bhattacharya DR
Bhattacharyya S
Bhimachar BS
Bhisey AN
Buchi EC
Chandrashekaran MK
Chopra BN
Das BK
Dass CMS
Datta Munshi JS

Dominic CJ
Dutta GP
Gadagkar R
Ganapati PN
Ghosh A
Gravely FH
Guha BS
Guraya SS
Har Swarup
Hora SL
Jairajpuri MS
Jhingran VG
Kanungo M
Lakhotia SC
Lal MB
Law SC
Manna GK
Mathai G
Mehra HR

Mehrotra KN
Moghe MA
Mookerjee HK
Mookerjee S
Mukherjee AS
Muthukkaruppan VR
Nagabhushanam R
Nair NB
Narayanan ES
Nayar KK
Pandian TJ
Pillai MKK
Prakash I
Prasad MRN
Rajasekarasetty MR
Ramamurthi R
Ramaswami LS
Rao AR
Rao CRN

Rao HS
Rao SRV
Rao TR
Ray Chaudhuri SP
Roonwal ML
Saha AK
Sathyanesan AG
Saxena KN
Saxena RN
Seshachar BR
Seshaiya RV
Setna SB
Seymour Sewell RB
Shah RV
Shah VC
Shanmugam G
Sharif M
Sharma GP
Sharma T
Sharma VP
Singh BN
Singh SN
Sinha VRP
Srivastava HD
Srivastava PN
Srivastava US
Sundararaj BI
Swarup K
Tewari HB
Thapar GS
Thapliyal JP
Vishwa Nath

Sectional Committee -VIII

Medical Sciences

Basic and Clinical Medical Sciences, Anthropology, Psychology

Agarwal SC
Anand BK
Baldev Singh
Bamji MS
Banerjee K
Banerjee S
Basu K
Basu NM
Berkeley-Hill OAR
Bhargava KP
Bhaskaran K
Bhat JV
Bose GS
Brahmachari UN
Burridge W
Chakravarti DN
Chakravarti RN
Chatterjea JB
Chattopadhyaya KP
Chaturvedi UC
Chaudhuri RN
Chopra RN
Chopra SRK
Chowdhury AB
Das Gupta CR
Das K
Dastur DK
Datey KK
De MN
De P
Deo MG
Dhawan BN
Dikshit BB
Dutta NK
Elwin V
Gangal SG
Ganguli HC
Ganguly NK
Ghosh TK
Ghurye GS
Gopalan C
Gopinath N
Govindaswamy MV
Greval SDS
Gupta JG
Hasan M
Heilig R
Hutton JH
Iyer LKA
Jussawalla DJ
Kamboj VP
Kar AB
Kasliwal RM
Khanolkar VR
Kini MG
Knowles R
Kochupillai N
Koshy PK
Krishnan KVA
Lal RB
Laumas KR
Luthra UK
Majumdar DN
Malhotra KC
Mangalik VS
Mathan VI
Mathur A
Mathur KS
Mills JP
Mitra K
Mitra S
Mitra SC
Mukerjee SM
Mukerji B
Mukherjee KC
Mukherjee SK
Narayana B
Nath I
Nayak NC
Nityanand S
Paintal AS
Pal RK
Pandit CG
Panja G

Pasricha CL
Patwardhan VN
Ramakrishnan T
Ramalingaswami V
Ramamurthi B
Ranadive KJ
Rao MVR
Ray AP
Ray JC
Reddy CRRM
Row R
Roy BB
Roy SC
Sanyal SC
Sarkar JK
Sarkar SS
Saxena PN
Seal SC
Sen AB
Sen HG
Sen JM
Sen PK
Sengupta NN
Sharma KN
Sheth AR
Shortt HE
Singh I
Singh J
Sinha AKP
Sinton JA
Sokhey SS
Soparkar MB
Sriramachari S
Stewart AD
Sukhatme PV
Sundaram K
Swaminathan M
Talwar GP
Tandon BN
Tandon PN
Taylor J
Tirumurti TS
Tribedii BP
Ukil AC
Vakil RJ
Valiathan MS
Venkoba Rao A
Viswanathan R
Wadia NH
Wahi PN
Zaidi SH

Sectional Committee -IX

Biochemistry, Biophysics, Molecular Biology, Microbiology and Immunology

Adiga PR
Bachhawat BK
Balaram P
Balasubramanian D
Barnabas J
Bhaduri AN
Bhargava PM
Bhattacharyya PK
Biswas BB
Bose JP
Burma DP
Chakravorty M
Chandra HS
Chatterjee SN
Das HK
Das J
Das MR
Das Gupta NN
Datta A
Datta AG
Easwaran KRK
Esh GC
Ganapathi K
Ganguly J
Giri KV
Gopinathan KP
Gupta CM
Jacob TM
Jagannathan V
Jayaraman R
Kannan KK
Kenkare UW
Krishnamurti CR
Krishnan PS
Kumar A
Maitra PK
Menon KKG
Moudgal NR
Nath MC
Notani NK
Padayatty JD
Padmanabhan G
Radhakrishnan AN
Ramachandran GN
Ramachandran LK
Ramakrishnan C
Ramanathan N
Ramasarma T
Rao MRS
Rao NA
Rao VSR
Sarma PS
Sasisekharan V
Sastry PS
Siddiqi O
Sivaraman C
Sreenivasan A
Srinivasan R
Subramanyam V
Surolia A
Tandon HD
Thomas J
Vaidyanathan CS
Varadarajan S
Vijayan M

Sectional Committee -X

Agriculture; Animal Husbandry, Fisheries and Forestry

Abrol IP
Arunachalam V
Ayyangar GNR
Bagchee KD
Basu BC
Beeson CFC
Bhatia C
Bhatia IS
Bhattacharya P
Bor NL
Burns W
Burt BC
Champion HG
Chatterjee NC
Choudhury B
Chowdhury KA
Datta SGA
De R
Deodikar GB
Dogra PD
Gadgil MD
Ganguli NC
Ghildyal BP
Gill B S
Gill KS
Gupta BM
Haddow JR
Husain A
Husain MA
Jain HK
Job TJ
Joshi AB
Kadam BS
Kanwar JS
Kapur SN
Kedharnath S
Khan AM
Khan H
Khush GS
Kothavala ZR
Kumar LSS
Lal KB
Modi VV
Mukerjee SK
Mukherjee SK
Mundkur BB
Murty BR
Narayanamurti D
Olver A
Pal BP
Panikkar NK
Panse VG
Pant NC
Parkinson CE
Paroda RS
Parthasarathy N
Pradhan S
Prasad R

Prihar SS
Pruthi HS
Ramiah K
Ramanujam S
Ramanujam S
Randhawa MS
Randhawa NS
Rao NGP
Ray HN
Ray SN
Raychaudhuri Sachi Prasad
Raychaudhuri Satya Prasad
Raychaudhuri Syama Prasad
Reddy GM
Sadhu DP
Sawhney K
Sekhon GS
Sen KC
Sethunathan N
Shastry SVS
Singh NT
Singh R
Subbarao NS
Sundararaj B
Swaminathan MS
Takkar PN
Trevor CG
Uppal BN
Vasudeva RS
Venkataraman TS
Verma JP
Vijayaraghavacharya T
Virk DS
Vishwanath B
Ware F
Yadava JNS

Elected Under Rule 7(e)

Jawaharlal Nehru
Indira Gandhi
J.R.D. Tata

M.A. Huque